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IDENTIFIERS	*Bakers; Military Curriculum Project

ABSTRACT

Both teacher and student materials are included for a bakery technology course designed to facilitate learning the fundamontal duties required in a dining facility or centralized pastry shop. One of a number of military-developed curriculum packages selected for adaptation to vocational curriculum and instruction, the course consists of seventeen lessons encompassing 157 hours of lecture and demonstration. Topics covered include safety and sanitation procedures (personal hygiene, food storage, management of bakery cleaning); equipment (mixers, fermentation cabinet and proof box, deep fat fryer, ovens, measuring devices); and types of bakery products, including the function of each ingredient (quick breads, cookies, pies, cakes, and yeast raised products). A program of instruction introduces the course to the instructor, provides a summary of the unit, and lesson plans. Three other sections of the course (School Introduction, M-1942 Portable Bakery Unit, and M-1945 Mobile Bakery Unit) are not included. The lesson plans include performance objectives, performance level codes, and references. The student materials, which make up the bulk of the document, include a student workbook which is also a reference text, a glossary of food service terms, a reference text on spices, and a programmed text on the prevention of food poisoning. Four military technical manuals are referenced as text materials, but are not provided in this package. (MEK)

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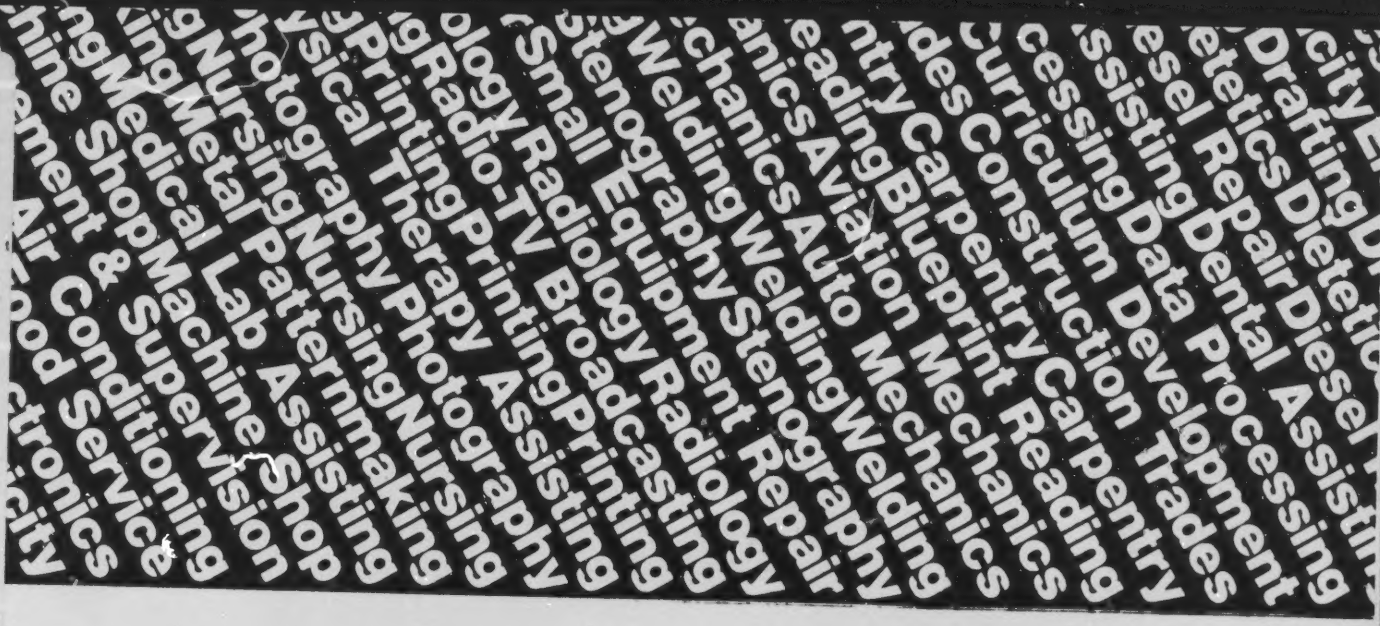

ED183959

Military Curricula for Vocational & Technical Education

BEST COPY AVAILABLE

BASIC BAKER

9-4

CE 024 836

THE NATIONAL CENTER
FOR RESEARCH IN VOCATIONAL EDUCATION
THE OHIO STATE UNIVERSITY

This military technical training course has been selected and adapted by The Center for Vocational Education for "Trial Implementation of a Model System to Provide Military Curriculum Materials for Use in Vocational and Technical Education," a project sponsored by the Bureau of Occupational and Adult Education, U.S. Department of Health, Education, and Welfare.

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MILITARY CURRICULUM MATERIALS

The military-developed curriculum materials in this course package were selected by the National Center for Research in Vocational Education Military Curriculum Project for dissemination to the six regional Curriculum Coordination Centers and other instructional materials agencies. The purpose of disseminating these courses was to make curriculum materials developed by the military more accessible to vocational educators in the civilian setting.

The course materials were acquired, evaluated by project staff and practitioners in the field, and prepared for dissemination. Materials which were specific to the military were deleted, copyrighted materials were either omitted or approval for their use was obtained. These course packages contain curriculum resource materials which can be adapted to support vocational instruction and curriculum development.

BASIC BAKER COURSE

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Glossary of Food Service Terms Page 74

Prevention of Food Poisioning - Programmed Text Page 144

Spices - Training Aids Page 321

BASIC BAKER COURSE **Classroom Course** **9-4**

Developed by:

United States Marine Corps

Development and Review Dates

November 8, 1972

Occupational Area:

Food Service

Target Audiences:

Grades 10-adult

Print Pages:

328

Cost:

$6.75

Availability:

Military Curriculum Project, The Center for Vocational Education, 1960 Kenny Rd., Columbus, OH 43210

Contents:	Type of Materials:	Lesson Plans:	Programmed Text:	Student Workbook:	Handouts:	Text Materials:	Audio-Visuals:	Instructional Design:	Performance Objectives:	Tests:	Review Exercises:	Additional Materials Required:	Type of Instruction:	Group Instruction:	Individualized:
				No. of pages											
Annex B															
Baking Technology		•	•	81		★			•					•	

★ Materials are recommended but not provided.

THE CENTER FOR VOCATIONAL EDUCATION

Expires July 1, 1978

Course Description

In this course students learn the fundamental duties required within a dining facility or centralized pastry shop. No prerequisite courses or skills other than high school reading level are required for this course. It is divided into four annexes: School Introduction, Baking Technology, M-1942 Portable Bakery Unit, and M-1945 Mobile Bakery Unit. Only the Annex B—**Baking Technology** covering 157 hours of lecture and demonstration is included in this package. The lesson topics and hours follow:

I-4 Personal Hygiene (1 hour)
I-5 Food Storage (1 hour)
I-6 Police of Bakery (1 hour)
I-7 Miscellaneous Equipment (1 hour)
I-8 Mixer (1 hour)
I-9 Fermentation Cabinet and Proof Box (.5 hour)
I-10 Deep Fat Fryer (.5 hour)
I-11 Steam Jacketed Kettle (.5 hour)
I-12 Ovens (.5 hour)
I-13 Measuring Devices (.5 hour)
I-14 Water Tempering (2 hours)
I-15 Formula Construction (1.5 hours)
I-16 Quick Breads (20 hours)
I-17 Cookies (25 hours)
I-18 Pies (32 hours)
I-19 Cakes (33 hours)
I-20 Yeast Raised Products (56 hours)

This course contains both teacher and student materials. A program of instruction introduces the course to the instructor, provides a summary of the annex, and lesson plans for each lesson. The lesson plans include the unit of instruction, time requirements, method of instruction, performance objectives, performance level codes, and references. The student materials include a student workbook which is a reference text, a glossary of food service terms, a reference text on spices, and a programmed text on the prevention of food poisoning.

Four military technical manuals are referenced as text materials, but these are not provided in this package. No audiovisuals are suggested for use with this course.

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BASIC
BAKER COURSE

PROGRAM OF INSTRUCTION

9-4

For Instructional Purposes Only

MARINE CORPS SERVICE SUPPORT SCHOOLS
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

ENCLOSURE (2)

4

PROGRAM OF INSTRUCTION

BASIC BAKER COURSE

BAKER 3311

FY 1973

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SECTION I - PREFACE

A. Course:	Basic Baker Course
B. Purpose:	Using realistic environmental and definitive performance standards predetermined through task analysis, to teach the basic baker the fundamental technical behaviors essential to his effective performance of duties within a dining facility, centralized pastry shop, or field bakery platoon.
C. MOS for which trained:	3311
D. Prerequisites:	(1) Private - Lance Corporal (2) Corporals without previous formal training in food service skills. (3) 3 or more year enlistment
E. Length:	Peacetime - 9 Weeks, 3 Days* Wartime - 7 Weeks, 0 Days*
F. Training Location:	Marine Corps Service Support Schools, Marine Corps Base, Camp Lejeune, North Carolina 28542
G. Feeder Pattern:	From Marine Corps Recruit Depot
H. Ammunition Required:	None
I. Classification:	Unclassified

* The time length for the various lessons in this program of instruction are estimated. Determination of the actual time required to attain the school level of performance indicated for each lesson is dependent upon testing, evaluation and finalization of associated lesson material.

SECTION II - SUMMARY

BASIC BAKER COURSE

P 9 Weeks, 3 Days W 7 Weeks, 0 Days

Subject	Hours		Phases			Annex	Page
	P	W	I	II	III		
A. Academic Subject							
School Introduction	5	5	5			A	4-A-1
Baking Technology	177	128	177			B	4-B-1
M-1942 Portable Bakery Unit	46	46		46		C	4-C-1
M-1945 Mobile Bakery Plant	32	32			32	D	4-D-1
Examination:							
Phase:							
Written	12	12	4	4	4		
Performance	14	14	4	4	6		
Final:							
Written	4	4			4		
Performance	4	4			4		
	(294)	(245)	(190)	(54)	(50)		
B. Nonacademic Time							
Administrative Time							
Processing in	16	8					
Processing out	16	8					
Physical Fitness	22	0					
Class Commanders Time	23	17					
Company Commanders Time	9	0					
Sub Total	(86)	(33)					
Grand Total	380	278					

The indicated peacetime (P) and wartime (W) lengths of the Basic Baker Course are predicated on a 40 hours training week. The Company Commander's time is accommodated outside of the normal instructional day. Therefore these times are not included in the course length as expressed in weeks and days.

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SECTION III - BODY

BASIC BAKER COURSE

ACADEMIC SUBJECTS

P 294 hours W 245 hours

Subject	Scope
School Introduction	Introduction to school: The information presented during this period will enable the student to describe: the purpose, scope and objectives of the Basic Baker Course; the tasks that he will be able to perform following successful completion of the inherent training; school policy and procedures relating to conduct of instruction, testing and grading; remedial and supplementary training and requirements for successful completion; current regulations pertaining to standards of performance and personal conduct; school policy concerning leave, liberty and the disposition of personal problems. The student will also be able to discuss the basic fundamentals of effective note taking and methods of study. Moral Guidance: After receiving the information presented during this period of instruction, the student will be able to: participate in and contribute to a class discussion on the dignity of man, his social obligations and the need for self-discipline; describe the satisfaction and pride accruing from a job well done. As a result of the information provided, the student will also be aware of the various religious and social programs available to him.

SECTION III - BODY

BASIC BAKER COURSE

ACADEMIC SUBJECTS

Subject	Scope
	The Food Service Program: The information provided the student during this period will enable him to: explain the titles, sequence of presentation, scope and specific objectives of each subject and lesson included in the Basic Baker Course, and his responsibilities in conjunction with the instruction; relate the mission of Food Services in the Marine Corps and the responsibilities of Marine Corps Bakery personnel to produce qualitative, eye appleaing and tasty bakery products prepared by the effective and safe use of material, equipment and ingredients provided in sanitary facilities.
Baking Technology	The Bakery Technology instruction focuses on the technical skills that the student will need to accomplish the duties of a baker assigned to a dining facility, central pastry shop or field bakery platoon. To demonstrate an understanding of the material presented, the student will be able to: define the various techniques of producing bakery products; identify the ingredients used in bakery production and cite their characteristic qualities; describe the various pieces of equipment essential to the production of bread and pastry products; recognize the sanitation procedures required for bakery personnel, equipment, and

Subject	Scope
	facilities; use good sanitation procedures while performing duties in a post or station bakery; produce a variety of quick breads, cookies, pies, cakes, and yeast-raised products by using the techniques taught in the course; operate and perform maintenance on the various items of bakery equipment used in garrison baking facilities.
M-1942 Portable Bakery Unit	This phase of instruction covers the operation and use of the M-1942 Portable Bakery Unit and the M-33 Ice Cream Plant, and provides the student realistic and comprehensive training which has been designed to develop the technical skills essential to performing the duties of a baker within a field bakery platoon. Given these instructions, the student will be able to: demonstrate an understanding by relating the operating procedures for the M-1942 Portable Bakery Unit and the M-33 Ice Cream Plant; utilize the M-1942 Portable Bakery Unit and component parts to produce bakery products in the field; produce ice cream in the field using the M-33 Ice Cream Plant; perform required operators maintenance on both the M-1942 Portable Bakery Unit and the M-33 Ice Cream Plant.
M-1945 Mobile Bakery Plant	The material covered in this phase will provide the student a comprehensive study in the operation and use of the M-1945 Mobile Bakery Plant to produce bread in the field. The

SECTION III - BODY

BASIC BAKER COURSE

ACADEMIC SUBJECTS

Subject	Scope
M-1945 Mobile Bakery Plant (cont'd)	technical knowledge and skills gained as a result of this study will enable the student to: operate the flour sifter, mixer, monorail, divider, moulder proofing cabinets, and ovens and other component parts of the M-1945 Mobile Bakery Plant; use the M-1945 Bakery Plant to produce bread under field conditions; perform essential operators maintenance on the M-1945 Mobile Bakery Plant and equipment.

SECTION IV - ANNEXES

BASIC BAKER COURSE

Each academic subject contained in the summary and body of this POI is listed as a separate annex:

School Introduction	Annex A, 4-A-1
Baking Technology	Annex B, 4-B-1
M-1942 Portable Bakery Unit	Annex C, 4-C-1
M-1945 Mobile Bakery Plant	Annex D, 4-D-1

Explanation of column arrangements utilized within these annexes:

Column 1: Lesson Plan File Numbers. An alpha-numeric system is used to formulate lesson plan file numbers. Upper-case alphabetical letters are used to formulate the short course title. For example, the short course title for the Basic Baker Course is "BBC". Roman numerals are used to indicate the phase of training during which a lesson plan is presented. Roman numeral one (I), for example, indicate the first phase of training, Roman numeral two (II), indicates the second phase of training, etc. Arabic numerals are used to indicate the sequence of lesson plans within a training phase. In this case, number 1 designates the first lesson plan, number 2 the second, number 3 the third, etc. The following combination of alpha-numeric digits is illustrative: BBC I-1 designates the first lesson plan presented in the first training phase of the Basic Baker Course. BBC II-4 designates the fourth lesson plan presented in the second training phase of the Basic Baker Course.

Column 2: Time. The time will be shown in hours or decimal portion of hours. However, all times will be consistent and will indicate peacetime (P) and wartime (W) requirements. When both requirements are identical the figure will be shown in the center of the column to represent both. The time lengths shown for the various lessons in this program of instruction are estimated. Determination of the actual time required to attain the school level of performance indicated for each lesson is dependent upon the testing, evaluation, and finalization of associated lesson material.

Column 3: Phase. Indicates the phase in which the class is taught.

Column 4: Method of Instruction.

L - Lecture

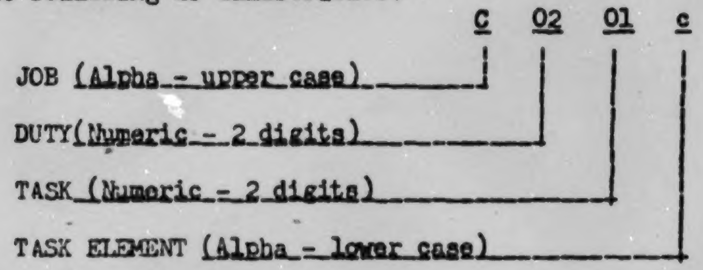
D - Demonstration

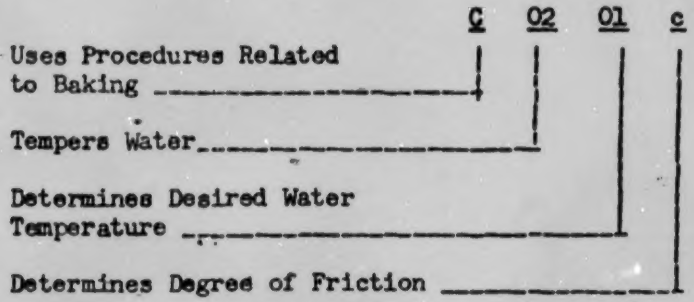
PA - Practical Application

Column 5: The Performance-Objective Reference Designator identifies the nature of the performance objective, that is, whether it is a general-knowledge-type requirement or a behavioral requirement identified through task analysis.

General-Knowledge Reference Designator. A Roman numeral is used in this column to identify a general-knowledge-type reference designator, e.g., "II. The Food Service Program." It identifies the general data or information which constitutes the framework of knowledge that will provide the student with the necessary appreciation, familiarization, or understanding required to learn to effectively accomplish the technical and/or leadership behaviors for which responsible in MOS assignments in the field. Subject matter that is identified as general-knowledge in nature does not lend itself to task analysis but a performance objective can be written for it nevertheless.

Task-Analysis Reference Designator. An alpha-numeric code is used to identify each subject encompassing specific technical and/or leadership behaviors which task analysis has determined that an individual must perform in billet assignments in the field. The following is illustrative:


C
02
01
c
JOB (Alpha - upper case)
DUTY (Numeric - 2 digits)
TASK (Numeric - 2 digits)
TASK ELEMENT (Alpha - lower case)


C
02
01
c
Uses Procedures Related to Baking
Tempers Water
Determines Desired Water Temperature
Determines Degree of Friction

The Alpha-Numeric Code C0201c, illustrated in the example provided above, designates the functional behaviors of the specific JOB, DUTY, TASK and TASK ELEMENT inherent in an MOS 3311 Billet which have been isolated by task analysis.

Column 6: Performance Level. An alpha-numeric Performance Level Code is used in this column to identify the performance level which must be attained by the student. Supervisory and proficiency codes defined below are combined to indicate the level of performance the student should attain in the course and the level of performance that must be demonstrated by the student on the job after leaving school.

Performance Level Code: The Alpha-Numeric supervisory and proficiency codes defined below are combined to indicate the level of performance the student should attain in the course and the level of performance that must be demonstrated by the student on the job after leaving school.

Supervisory Code	Definition
1.	Needs assistance and close supervision on all but the simplest tasks.
2.	Handles routine tasks but needs close supervision.
3.	Handles routine tasks thoroughly but needs assistance in performing difficult tasks.
4.	Handles all tasks competently with little supervision.
5.	Can complete all tasks quickly and accurately and is able to instruct others in how to perform.

Proficiency Code	Definition
a.	The individual can recognize terms, facts, and theories.

b. The individual recalls, relates and uses terms, facts, and procedures in a step-by-step performance in order to develop simple skills.

c. The individual recalls, relates and uses knowledge and skills to perform simple tasks.

d. The individual uses acquired skills and knowledge to perform complex and related tasks.

e. The individual uses theory and practice to evaluate situations, courses of action.

Example: A performance level code of "3c" would indicate that the individual "recalls, relates, and uses knowledge and skills to perform simple tasks" and, in doing so, "handles routine tasks thoroughly, but needs assistance in performing difficult tasks."

An asterisk in column six will indicate that the School Level of Performance is attained as a result of the repetitious application of the behavioral skills derived from that lesson and exposure to related subject material inherent in the lesson(s) identified by the lesson plan file number(s) indicated immediately below the school's performance level code.

For example, an asterisk shown in column six of lesson plan number BBC I-13 Measuring Devices, followed by lesson plan numbers BBC I-16 through 20, BBC II-6 and BBC III-8, indicates that the school level of performance with the measuring devices is attained as a result of repetitive application of the skills learned in BBC I-13 and the exposure to related subject material inherent in lesson BBC I-16 through 20, BBC II-6 and BBC III-8.

Column 7: Reference. Includes any official publication, manual, etc., used to develop the lesson plan in support of the performance objective.

MODIFICATIONS

Pages 4-A-1 — 4-A-3 of this publication has (have) been deleted in adapting this material for inclusion in the "Trial Implementation of a Model System to Provide Military Curriculum Materials for Use in Vocational and Technical Education." Deleted material involves extensive use of military forms, procedures, systems, etc. and was not considered appropriate for use in vocational and technical education.

SECTION IV - ANNEXES

ANNEX B

BAKING TECHNOLOGY

P 177 W 128

SUBJECT LP NO	TIME P	 W	PHASE	METHOD OF INSTN	PERFORMANCE OBJECTIVES	PERFORMANCE LEVEL CODE FLD	 SCOL	REFERENCE CODE
BBC I-4 Personal Hygiene	1		I	L	A-01. Given instructions on personal hygiene and mess sanitation, and provided the necessary toilet articles, cleaning material and equipment, the student must be able to: practice sanitary work habits in his daily work; meet the prerequisites for obtaining a food handlers certificate; and carefully groom daily for work in the bakery shop. (no set time)	2b	2b	TM 10-410 Chapter 7
BBC I-5 Food Storage	1		I	L	A-02. Given instructions on food storage procedures and having access to subsistence items and storage facilities with storage racks, containers, and refrigeration space, the student will be able to: select proper storage space, store and rotate food in accordance with current directives. (no set time)	2b	2b	TM 10-410 Chapter 4

SECTION IV - ANNEXES

ANNEX B

BAKING TECHNOLOGY

SUBJECT LP NO	TIME P W	PHASE	METHOD OF INSTN	PERFORMANCE OBJECTIVES	PERFORMANCE LEVEL CODE FLD	SCOL	REFERENCE CODE
BBC I-6 Police of Bakery	1	I	L	A-03. Given instructions relative to the procedures used to police a garrison bakery, and provided the necessary cleaning material, the student will be able to: use these procedures to clean lights fixtures, fans, windows, walls, decks, refrigerators and other equipment in the bakery; and maintain proper sanitation during and after production of bakery products. (no set time)	2b	2b	TM 10-410 Chapter 7
BBC I-7 Miscellaneous Equipment	1	I	L,D	B-01. Given instructions relative to the use of the miscellaneous equipment in a bakery shop, the student will be able to: identify and use the various items of miscellaneous equipment in his work; utilize safe and sanitary work habits when using the miscellaneous equipment. (no set time)	2b	2b	TM 10-411 Appendix 11

SECTION IV - ANNEXES

ANNEX B

BAKING TECHNOLOGY

SUBJECT LP NO	TIME P	TIME W	PHASE	METHOD OF INSTN	PERFORMANCE OBJECTIVES	PERFORMANCE LEVEL CODE FLD	PERFORMANCE LEVEL CODE SCOL	REFERENCE CODE
BBC I-8 Mixer	1		I	L,D	B-02. Given instructions on the operation and use of various types of mixers used in bakery production, and provided operation, safety and control charts, the student will be able to: process operating instructions, start, stop and operate the mixers as required for production; implement sanitation and use safety procedures as required by current directives. (29 minutes)	2b	2b	TM 10-415 Chapter 18
BBC I-9 Fermentation Cabinet and Proof Box	.5		I	L,D	B-03. Given instructions relative to the operation and use of the fermentation cabinet and proof box, and provided operation, safety, and control charts, the student will be able to: process the instructions, start, stop and operate the fermentation cabinet and proof box as required in bakery	2b	2b	TM 10-410 Chapter 13-101

SECTION IV - ANNEXES

ANNEX B

BAKING TECHNOLOGY

SUBJECT LP NO	TIME		PHASE	METHOD OF INSTN	PERFORMANCE OBJECTIVES	PERFORMANCE LEVEL CODE		REFERENCE CODE
	P	W				FLD	SCOL	
BBC I-9 (cont'd)					production; implement sanitation procedures as required during and after use of the equipment. (39 minutes)			
BBC I-10 Deep Fat Fryer	.5		I	L,D	B-04. Given instructions relative to the operation and use of the deep fat fryer in bakery production, provided operation, safety and control charts, and having access to normal equipment and cleaning material, the student will be able to: process instructions and place fat in fryer; start, stop, and operate the deep fat fryer in accordance with instructions; and implement sanitation and safety procedures as required by current directives. (70 minutes)	2b	2b	TM 10-415 Chapter 12

SECTION IV - ANNEXES

ANNEX B

BAKING TECHNOLOGY

SUBJECT LP NO	TIME P	TIME W	PHASE	METHOD OF INSTN	PERFORMANCE OBJECTIVES	PERFORMANCE LEVEL CODE FLD	PERFORMANCE LEVEL CODE SCOL	REFERENCE CODE
BBC I-11 Steam Jacketed Kettle	.5		I	L,D	B-05. Given instructions in the operation and use of the steam jacketed kettle, provided operation, safety and control charts, and having access to normal equipment and cleaning material, the student will be able to: process instructions, start, stop, and operate the steam jacketed kettle; and implement sanitation and safety procedures as required. (28 minutes)	2b	2b	TM 10-415
BBC I-12 Ovens	.5		I	L,D	B-06. Given instructions on the operation and use of the bake ovens used in normal bakery operations, provided operation, safety and control charts, and having access to normal equipment and cleaning materials, the student will be able to: start, stop and operate oven to bake bakery products; implement sanitation and use safety procedures as required. (29 minutes)	2b	2b	TM 10-415 Chapter 10

SECTION IV - ANNEXES

ANNEX B

BAKING TECHNOLOGY

SUBJECT LP NO	TIME P	 W	PHASE	METHOD OF INSTN	PERFORMANCE OBJECTIVES	PERFORMANCE LEVEL CODE FLD	 SCOL	REFERENCE CODE
BBC I-13 Measuring Devices		.5	I	L,D	C-01. Given instructions relative to the use of weights and measuring devices used in a bakery, and having access to a set of bakers scales, volumn measures, and ingredients, the student will be able to: use these devices to accurately weight and measure the liquid and solid ingredients required for any given product. (no set time)	2b * BBC I-16 through 20 BBC II-6 BBC III-8	2b	TM 10-410 Chapter 13
BBC I-14 Water Tempering	2		I	L,D,PA	C-02. Given instructions on the procedures for tempering water, a formula, thermometer and required ingredients, the student will be able to: determine the ingredient temperature and calculate the desired water temperature; determine the amount of ice required to properly temper the water. (no set time)	2b * BBC I-16 through 20 BBC II-6 BBC III-8	2b	TM 10-410 Chapter 11

SECTION IV - ANNEXES

ANNEX B

BAKING TECHNOLOGY

SUBJECT LP NO	TIME P W	PHASE	METHOD OF INSTN	PERFORMANCE OBJECTIVES	PERFORMANCE LEVEL CODE FLD	 SCOL	REFERENCE CODE
BBC I-15 Formula Construction	1.5	I	L,D,PA	C-03. Given instructions relative to formula construction in baking, provided an Armed Forces Recipe Service and a product sheet, the student will be able to: select the correct formula for a bakery product from the Armed Forces Recipe Service; transfer the formula to a product sheet; increas or decrease the formula on the product sheet as appropriate; and use to make the product. (30 minutes)	2b * BBC I-16 through 20 BBC II-6 BBC III-8	2b	TM 10-410 TM 10-411
BBC I-16 Quick Breads	20	I	L,D,PA	D-02. Given instructions relative to procedures for making quick breads and provided a formula, necessary ingredients and normal bakery equipment, the student will be able to: assemble and process ingredients; prepare pans, mix batter and dough for quick breads; make-up and pan dough or batter, and bake; mix and apply topping to finished product. (90 minutes)	2b * BBC I-13 BBC I-14 BBC I-15	2b	TM 10-411 Chapter 8

4-B-7

SECTION IV - ANNEXES

ANNEX B

BAKING TECHNOLOGY

SUBJECT LP NO	TIME P W	PHASE	METHOD OF INSTN	PERFORMANCE OBJECTIVES	PERFORMANCE LEVEL CODE FLD	PERFORMANCE LEVEL CODE SCOL	REFERENCE CODE
BBC I-17 Cookies	25	I	L,D,PA	D-03. Given instructions relative to the preparation of cookies, and provided a formula, necessary ingredients and normal equipment, the student will be able to: assemble and process ingredients; prepare pans; mix and make-up cookie doughs; pan and bake cookies in accordance with recipe. (100 minutes)	2b * BBC I-13 BBC I-14 BBC I-15	2b	TM 10-411
BBC I-18 Pies	32	I	L,D,PA	D-04. Given instructions relative to the preparation of pies, provided a formula, necessary ingredients, and having access to normal bakery equipment, the student will be able to: assemble and process ingredients; accurately weigh and measure ingredients necessary to make pie filling and pie dough for single and double crust pies; prepare pie filling and mix pie dough; prepare pans, make crust and fill pies; bake pies, mix and apply topping to the finished product in accordance with recipe specifications. (128 minutes)	2b * BBC I-13 BBC I-14 BBC I-15	2b	TM 10-411 Chapter 5

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SECTION IV - ANNEXES

ANNEX B

BAKING TECHNOLOGY

SUBJECT LP NO	TIME P W	PHASE	METHOD OF INSTN	PERFORMANCE OBJECTIVES	PERFORMANCE LEVEL CODE FLD	SCOL	REFERENCE CODE
BBC I-19 Cakes	33	I	L,D,PA	D-05. Given instructions relative to the preparation of cakes, provided a formula, necessary ingredients and having access to normal bakery equipment, the student will be able to: assemble and process ingredients; prepare pan, mix and pan cake batter; bake cakes, mix icing, and ice the finished products. (98 minutes)	2b * BBC I-13 BBC I-14 BBC I-15	2b	TM 10-411 Chapter 6
BBC I-20 Yeast Raised Products	56	I	L,D,PA	D-06. Given instructions relative to the production of yeast raised products, provided a formula, necessary ingredients and normal bakery equipment, the student will be able to: assemble and process ingredients; prepare pans, mix and ferment yeast dough and make-up desired product; pan, proof, and bake yeast raised product; mix icing, and apply to finished product. (233 minutes)	2b * BBC I-13 BBC I-14 BBC I-15	2b	TM 10-411 Chapter 9

MODIFICATIONS

Pages 4C-1 — 5-1 of this publication has (have) been deleted in adapting this material for inclusion in the "Trial Implementation of a Model System to Provide Military Curriculum Materials for Use in Vocational and Technical Education." Deleted material involves extensive use of military forms, procedures, systems, etc. and was not considered appropriate for use in vocational and technical education.

BASIC BAKER COURSE

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STUDENT WORKBOOK

9-4

For Instructional Purposes Only

FOOD SERVICE SCHOOL COMPANY
MARINE CORPS SERVICE SUPPORT SCHOOLS
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

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BAKERS HANDOUT

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Ref: (A) Navy-Marine Corps Recipe service
     (B) TM 10-410
     (C) TM 10-411
     (D) Treatise of Baking
     (E) Treatise of Cake Baking
     (F) TM 10-405

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BAKING TERMINOLOGY

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ABSORPTION, FAT - Fat which is absorbed in foodproduct as they are fried in deep fat.

ABSORPTION, WATER - The amount of water required by ingredients, usually flour, to form a workable dough or batter.

BAKING - Cooking by dry heat, usually in an oven.

BLEND - To combine and thoroughly mix two or more ingredients in making a food product.

BATTER - Several ingredients mixed together to form a semi-liquid mixture suitable for baking or cooking.

CARMELIZE - To brown or color the sugary agent in doughs or batter by baking.

CENTIGRADE - Having as thermometer a scale in which the freezing point is 0°. To change centigrade to farenheit, multiply centigrade by 9/5ths and add 32. The product is the equivalent in farenheit.

CREAM/CREAMING - Mixing until smooth, sugar, shortening and other ingredients. Creaming incorporates air in the mixture.

DOCK/DOCKING - To cut or puncture impressions in dough to allow expansion or escape of steam.

DOUGH, OLD - Yeast dough which has become over-fermented due to long fermentation. Thisproduces finished yeast goods light in color, sour in flavor, low in volume, coarse in grain and rough in texture.

DOUGH, YOUNG - Yeast dough which is under-fermented. This produces finished yeast goods which are dark in color, light in texture, low in volume. (Heavy).

EMULSIFICATION - The process of blending together fat, water or water solutions of ingredients to produce a stable mixture which will not separate on standing.

EXTRACT - A flavoring agent, usually an extraction of fruit, etc. in concentrated form.

FARENHEIT — Having as thermometer a scale in which the freezing point of water is 32° and the boiling point is 212° above zero; named for its inventor G. E. Fahrenheit. To change fahrenheit to centigrade subtract 32 from degrees and multiply the remainder by 5/9ths. The product is the equivalent in centigrade degrees.

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FERMENTATION - A chemical andphysical change in dough brought about by the yeast breaking down sugar into alcohol and carbon dioxide gas causing the dough to raise and become light.

FERMENTATION, PEAL - The maximum raising the dough mass before receding or falling.

FLAKY PIE CRUST - Pie crust made by leaving of shortening in the dough which, as the dough is rolled out, forms layers offat to give a flaky effect to finished crust.

FLOUR - Interior portion of the wheat grain reduced to a fine powder, from which the bran, germ and coarser particles have been removed.

FLOUR, HARD WHEAT - Flour that is high protein content used for bread and yeast raised products.

FLOUR, SOFT WHEAT - Flour that is low in protein content used for primarily cakes, pastries and quick breads.

CRIMP - The act of crimping the edges of top and bottom of pie crust to improve scaling of pie.

FORMULA - A recipe or description of amounts of ingredients and methods or steps to use to prepare a certain product.

FONDANT - A mixture of cooked sugar, water and corn syrup beaten smooth used for icings and candy making.

GLUTEN - Gluten is the tough, rubbery elastic substance which is formed in a dough by the addition of water to wheat flour which contains gluten-forming proteins; gluten forms the structure and frame work.

CREASE - The oiling or lubrication of pans to eliminate the sticking of baked products.

HI-RATIO - The ability of shortening to take on water without separating. Also, the terms applied to a cake mixture that contains a larger amount of sugar than flour.

HUMIDITY - The amount of moisture or water vapor contained in the air.

ICING - A sugary frosting; the act of putting frosting on baked products.

INGREDIENTS - The items used in formula or recipes for producing a product.

LEAVENING - The act or ingredient causing the rising of a dough or batter.

MAKE-UP - The act or process of forking a dough or batter into specific units or shapes.

MIX - To blend or beat several ingredients together.

OIL - A fat or shortening that remains in a liquid form at room temperature.

PIPE - To squeeze jelly or icing through a tube or bag on a product.

PROOFING - The raising period allowed a panned or made-up yeast dough product before baking.

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PROOF BOX/CABINET - The container or room with controlled heat and humidity used for proofing of yeast dough products before baking.

PUNCH/PUNCHING - To knead or work the carbon dioxide gas from a fermenting yeast dough.

QUICK BREADS - Bread substitutes made with chemical leavening which requires no fermentation time.

RISE - The lightening or aerating of the product by a leavening agent or method causing it to increase involume.

REST - The time allowed a punched or retarded dough to loosen the structure and rise again.

RETARD - The slow down or stopping of fermentation by control.

ROUND - To mold into round balls the dough for intermediate proof or rest.

SCALE - To weigh ingredients for dough or batter.

SCRAPER - The baker's implement measuring about 4" x 6", rectangular in shape with a wooden handle riveted to the top. Serves as a cutter, cleaning tool and scraper.

SHORTENING - Any edible fat or oil that is solid or plastic at room temperature such as butter, lard, and vegetable fats.

SPATULA - A knife-like instrument with a thin, flat, flexible blade used in baking for spreading batters and placing icing on baked products.

SUSPEND - To dissolve sugar, yeast, salt or milk solids in a liquid.

TEMPERATURE, MIXING - The temperature of dough when it is thoroughly mixed and ready to begin fermentation.

TEXTURE - The cell structure of the crumb of a baked product.

WEEP - The term applied to custard filling that becomes watery during baking. Weeping is caused by baking too long at too high a temperature.

WHIP - To beat rapidly, to increase volume by incorporating air.

FLUTE - To raise the edge of a single crust pie in a decorative design.

LEAVENING AGENTS

Leavening agents are substances or procedures, which are used to lighten or raise dough, or batter, from which baked or fried cereal products, such as breads, cakes, doughnuts, rolls and biscuits are made. Lightening or raising the dough or batter is accomplished by the formation of tiny bubbles of gas or air in the mass. If leavening agents are used, the tiny bubbles are formed and distributed evenly throughout the dough or batter. During the cooking process, the gas or air in the bubbles expand and dough or batter encompasses the bubbles solidifying into a light, spongy, cellular structure which is attractive and easily digestable.

From a practical point of view, leavening agents can be classified according to the manner used to incorporate the gas or air into the dough or batter mass. By this system, leavenings are of the three following types:

a. Biological Leavens. Biological Leavens are leavens which produce carbon dioxide gas by breaking down the constituents of the dough, or batter, by fermentation. Yeast is the common Biological Leavening agent.
b. Chemical Leavens. Chemical Leavens are leavens which produce carbon dioxide gases by chemical reaction of the leavening alone, leaving the dough, or batter constituents unaffected. Baking powder is the common Chemical Leavening agent.
c. Mechanical Leavens. Mechanical Leavening includes those processes by which air is incorporated into the dough or batter by whipping or beating.

BIOLOGICAL LEAVENS

Biological leavens were the first to be used by man. Indications are that yeast and leavens were used in a crude way thousands of years ago. While the ancients used yeast in its more primitive forms for baking, they had little knowledge of its true nature or of the process of fermentation. Rather, they looked upon fermentation as the manifestation or sign of some supernatural power. The first important scientific discovery concerning yeast was in 1680 when the first yeast cells were discovered, but they were not recognized as living organisms associated with fermentation. For nearly a century, the exact nature of yeast was not known. For several years a contraversy waged on this subject, but no definite information was established until in 1859, Louis Pasteur, after considerable experimentation, first demonstrated positively that yeast was a living organism, capable of growth and reproduction and was actually the cause of fermentation.

Because of this, Louis Pasteur, one of the most famous scientists the world has ever known, has rightly earned his title of "The Father of Fermentholhy".

The definition of year is as follows: Yeast is a microscopic one-celled plant which ordinarily multiplies by a process known as budding, and which under suitable conditions causes fermentation by its ability to change sugar into alcohol and carbon dioxide. Yeast is common in nature; spores are found in the air floating on dust particles and on the skin of ripening fruits. Each individual yeast plant is round or oval in shape and measures and about 1/3600 of an inch in diameter.

Function of Yeast. When yeast is incorporated into a dough, it brings about fermentation. This action converts the heavy mass of dough into a light, porus, plastic product which when baked is appetizing, nutritious and easily digestable. In short, fermentation raises and conditions the dough batch. While these two functions occur simultaneously, they may be better understood as two actions, namely:

(a) Primary Action. The primary action causes the dough to rise. It is the result of enzymes which reduce and breaks up sugar into alcohol and carbon dioxide gas accumulates in small cells or bubbles distributed throughout the dough. As the volume of gas increases, these tiny cells expand, causing the gluten in the dough to stretch. This action causes the dough to increase in volume (rise) and become light and porous. The evolution of carbon dioxide in the dough increases the acidity of the dough. This acid assists in softening the dough and imparts necessary stretching qualities of the dough. The alcohol produced along with the carbon dioxide evaporates from the dough during the baking process.

(b) Secondary Action. The secondary action consists of conditioning the dough. Yeast dough is made up of tiny particles of starch and gluten mashed together and combined with the yeast cells and ingredients of the dough to stretch under the pressure of the carbon dioxide gas without breaking short. Thus, this action makes possible the spongy, springy character of the dough which results in light and easily digestable product as the production of the carbon dioxide gas causes the dough to rise and to become light and porous.

Factors Affecting the Action of Yeast.

Moisture. Yeast requires a certain amount of moisture for its growth. The more water present, within certain limits, the less resistance there is to development of tye yeast cells.

Mineral Matter. Certain mineral salts are necessary for the nutrition of theyeast cells. The sulfates in slightly hard water are valuable for nutrition of the yeast.

Temperature. Yeast thrives best at temperatures from 78° to 90°F. At temperatures lower than 78°F, its action diminishes and is killed and resumes activity after being slowly thawed at temperature of 40° to 45°F. Slow thawing is necessary to permit it to re-absorb the water. Temperatures above 90°F inhibit the growth of yeast and a temperature of 104°F will destroy yeast cells if they are moist. In order to get the best results, doughs using yeast should be of a temperature range of 78° to 82°F.

AIR. Air is not necessary for yeast fermentation, but it accelerates the process. However, it is necessary for health growth and reproduction of yeast cells.

SUGAR. Sugar must be present if yeast action is to take place.

ALCOHOL. Alcohol affects the activity of yeast. As alcohol is produced during fermentation, the activity of the yeast decreases. When the amount of alcohol reaches about 20%, the dough must be punched to allow the alcohol to escape in order for the yeast to become active again.

SALT. Salt slows the action of yeast and 5% (based on the weight of the flour) will destroy the yeast cell activity. In amounts of 0 to 3%, based on the weight of the flour, the retarding action of the salt sometimes causes undesirable fermentation.

MIXING. The more thoroughly and evenly the yeast cells are distributed throughout the dough, the better and the quicker the fermentation will be.

TYPES OF YEAST USED IN BAKING. The principal forms of yeast available for use in the service are: (1) Compressed Yeast; and, (2) Active Dry Yeast.

(1) Compressed Yeast. Compressed yeast is a pure culture of yeast grown in a combination of molasses and grain. This mixture ferments for about 18 hours; after fermentation, the liquid from the fermenters is pumped into yeast seperators, which remove the heavier yeast from the liquid by centrifugal actions similar to that of a cream seperator. The thick solution that remains is then put through fulter presses where most of the remaining water is expelled from the mass of yeast cells. The yeast is then passed into machines that cut and wrap the yeast in one pound or one-half ounce cakes.

a. Storage. Compressed yeast is highly perishable. It should be refrigerated upon receipt and used as soon as possible. The best storage temperatures are from 35° to 45°F. If long periods of refrigeration are necessary, the yeast should be frozen.

b. Fermentation Test. A way to test the fermentation power of compressed yeast may be made by noting the time required for a small ball of yeast to rise to the surfact of a sugar solution. To make this test, weigh one-half ounce of yeast and mold into compact balls. If the yeast is too dry to mold, a little water may be added. Use one cup (8 oz.) of water at a temperature of 80°. Dissolve a half ounce of sugar in the water. Drop yeast ball in sugar water solution and note the number of seconds required for the ball to rise to the surfact. Goodyeast should rise to the surface of the water in less than 60 seconds.

(2) Active Dry Yeast. Active dry yeast is compressed yeast which has been dehydrated until it contains only 8% moisture or less. The removal of the water leaves a highly concentrated form of yeast containing about three times as many yeast cells per unit of weight as compressed yeast. However, many of the yeast cells are destroyed or damaged in the drying process and only about twice as many yeast cells remain alive and capable of growth. This means that one pound of active dry yeast has approximately the same leavening power as two pounds of compressed yeast.

The yeast cells in active dry yeast are relatively dormant and cannot start fermentation until they have become active again. Therefore, active dry yeast must be reconstructed before use. After reconstitution, the yeast will ferment dough at approximately the same rate as compressed yeast. (Note: The manufacturer always includes a formula for reconstituting the dry yeast. This should be carefully followed). Active dry yeast is packaged in 2 or 4 pound metal cans and heretically sealed. It can be stored at normal temperature of 70° to 80° for 5 to 6 months without losing its strength. It will lose its strength more rapidly at higher temperatures, but is not affected by cold. Because of its concentrated leavening power and because it does not require refrigeration, active dry yeast is used almost entirely overseas and in the field.

CHEMICAL LEAVENS

Chemical leavens appeared in England in 1834. These early English leavens were a mixture of potassium carbonate and alum. In 1837, the first patent for baking powder was awarded. It consisted of hydrochloric acid (a liquid) and bicarbonate of soda. The next step in the development of baking powder was the use of a solid acid ingredient instead of the liquid hydrochloric acid.

A patent for a baking powder composed of acid phosphate (a white powder) and bicarbonate of soda was awarded in 1864. Today most of the baking powder produced in the United States uses a mixture of sodium aluminum sulfate (S.A.S.) and monocalcium phosphate as the acid substance.

Description of Baking Powder. The term baking powder is applied to a new compound that is incorporated into dough or batter to produce gas for leavening by chemical reaction material. So long as the powder is kept dry, its acid and alkaline parts do not combine with each other, but whenmoistened, combination takes place and carbon dioxide gas is produced by the chemical reaction. Reduced to its simplish equation, baking powder can be expressed as follows: Acid plus bicarbonate of soda plus liquid plus heat equals carbon dioxide gas plus natural salt.

Action of Baking Powder. In the presence of both heat and moisture, the acid reacting salts act upon the bicarbonate of soda, releasing carbon dioxide gas. Part of this gas is absorbed by the liquid in the batter. The rest of this gas gradually pushes its way into the air cells in the dough or batter (formed in mixing), helping them to expand and produce greater volume until the batter or dough is "set" by the baking process. In this way, the finished cake secures its light porus cell-like structure. Baking powder distributed through the dough or batter in themixing process, gradually loses its identity as the reaction producing the carbon dioxide gas proceeds. When this action is completed in the oven, the baking powder will have been used up or destroyed, and in its place there are left residual substances which form part of the product itself. In service mess, the baking powder used is called "double acting". This means, that it begins to give off part of its carbon dioxide gas as soon as it comes in contact with water and is completed with contact with heat. At this time we are using mostly slow-acting baking powder.

Storage of Baking Powder. Dryness and protection from sudden drastic changes of temperature and from contaminating odors are the main requirements for good storage. Any well-made baking powder, under ordinary storage conditions, will keep satisfactorily for one year.

Substitute for Prepared Baking Powder. In the event no baking powder were available, bicarbonate of soda and an acid could be used. The acid used is usually sour or butter milk. This combination will cause leavening, but it has the draw-back of not being consistent in the amount of carbon dioxide gas used. Generally, when bicarbonate of soda is used with sour milk, the amount is as follows:

One-half teaspoon of bicarbonate of soda for each cup (6 oz.) of flour.

MECHANICAL LEAVENING

Mechanical leavening is the incorporation of air or carbon dioxide gas into dough or batters by creaming, whipping or beating. Any product that is mixed vigorously, a certain amount of mechanical leavening occurs, but the outstanding examples are in butter cream type cakes and foam or sponge type cakes.

When shortening and sugar are creamed together, the mixture becomes lighter and occupies more volume. This is due to the fact that air is gradually being whipped into the mixture. When heated in the oven, these cells, due to vaporization of moisture in the mixture, expand and cause the product to rise. This creaming process of aeration or leavening is most prominent in the making of butter cream type cakes.

When eggs are beaten or whipped, a fluffy, foam-like mass, full of air is formed. When this whipped mixture is incorporated in the batter, the air which it contains is carried and held in the batter. The expansion of these air cells during baking causes the cake to rise and become light and porous. Sponge or foam type cakes containing beaten egg whites or whole eggs are examples of mechanical leavening. Anytime, by long vigorous mixture and as air expands when heated, during the baking process, the product will rise in volume and have a lighter texture.

QUICK BREADS

BREAD SUBSTATUTES
All WAYS SERVED HOT.

There are a wide variety of baked products called quick breads. Quick breads are so called because of the short time needed to prepare them as compared with yeast breads. Quick breads depend on a chemical leavening agent, baking powder, soda or both for leavening. The most common quick breads are biscuits, corn bread, muffins and quick coffee cake.

① (DOUGH) (BATTER) BATTER BATTER

Essentially the same ingredients are used in all of these products. The batters anddoughs from which they are made are mixtures of flour and liquid of varying proportions.

CHIEF STRUCTRUL BUILDER
GIVES FLAVOR.

Other ingredients, such as shortening, eggs, and flavoring materials are added to provide tenderness, texture and distinctive flavor.

INPOR. — Some quick bread mixtures are called batters and others are called dough.

A batter is a mixture of such consistency that it can be beaten or stirred. Batters are designated as pour or drop batters. A pour batter is thin enough to pour; a drop batter is dropped from a spoon. Corn bread, muffins, and quick coffee cake are both soft and stiff dough. Biscuits are made from soft doughs.
—NEED AND ROLLED

The leavening action of baking powder and soda begins as soon as these ingredients come into contact with moisture; this process is hastened by heat and retarded by cold. Therefore, in any bread containing a chemical leavening agent, the combining of liquid with dry ingredients should be left until the last possible moment. The mixture should be stirred, never beaten, for long periods before making; they should be turned into baking pans and kept in the refrigerator.

BAKING POWDER BISCUITS (DOUGH)

(CAN USE YEAST)

Good biscuits are symetrical in shape, with straight sides and slightly rounded top, golden brown in color; they are creamy white inside, with an even flaky texture; fine grained and delicate biscuits may be thick or thin, crusty or soft according to preference.

In making baking powder biscuits, there are very few ingredients used; consequently, each ingredient is of great importance. This being the case, extreme care should be used when weighing or measuring the ingredients. Flour furnishes body to the biscuit so that it will keep its shape; shortening furnishes tenderness, flavor and good value; salt brings out and enhances flavor, and baking powder or soda and sour or butter milk raises the biscuit and tenderizes the finished product. Milk gives color and food value and like water, imparts the necessary moisture to the baked biscuit.

1. SALT STRENGHTENS PROTIENS IN FLOUR.
2. BAKING POWDER IS USED THE MOST.

EATABLE ACIDS
VINAGAR.
SOUR MILK

Mixing: After scaling, (weighing or measuring) mix flour, baking powder, and salt thoroughly so that when htese ingredients are sifted an even distribution will be obtained. Sifting of the dry ingredients insures a well-blended dough with a minimum of mixing. This is a definite aid in producing light, tender biscuits. Add shortening to the dry ingredients and so doing a large amount of the fat will be covered with flour. This condition is an aid in obtaining a tender biscuit both in the crumb and crust. After the flour mixture and shortening have been blended together until the consistency of cornmeal, add the liquid, pouring it over as large a surface of the ingredients as possible so that very little mixing of the dough need be done. Just enough liquid should be used to make a soft dough which can be handled; too much liquid makes the dough sticky and results in biscuits poor in shape; insufficient liquid makes the biscuits tough and compact. After the liquid has been added to the blended dry ingredients and shortening, mix until dough is formed. Biscuit dough should be kneaded a little. This kneading must be extremely light and gentle and no longer than one-half minute. The kneading helps produce a good volume, fine flaky texture and good smooth crust. Avoid overmixing or kneading as this will cause biscuits to be tough and may cause lopsided bisciuts.

When the dough is mixed, placed it on the work bench and roll out to the desired size with as little rolling as possible. The dough should be a uniform thickness so that the finished biscuits will be the same size and will bake evenly. Cut with floured biscuit cutter, placing all scraps to the side to be rolled last. Place the cut pieces adjoining each other on greased baking pans.

Correct oven temperature isimportant for best results. Too hot of an oven makes the biscuits soggy inside; if the temperature is too low, the biscuits will be dry and inferior in shape. Bake the biscuits at 425° to 450°F. for about 15 minutes. To give more color to the top crust, the biscuits may be washed with milk before baking. This type of baked goods is most paratable when served hot, and will fit well into the menu in several different ways, as portion of the main meal or as part of the dessert.

EGGS, USED CHIEFLY IN → MUFFINS

Good muffins are symetrical in shape, with straight sides and a slightly rounded top; never peaked or cracked. The case is rich golden brown with rough pebbly texture, slightly glazed in appearance. The grain is uniform and coarse, with medium sized air cells and a moist tender crumb.

The first and foremost success secret is in the mixing. The important thing in making muffins is barely to dampen the dry ingredients. The batter must be stirred, never beaten, only until the dry ingredients are thoroughly moistened. At this stage the mixture will appear lumpy, and will break easily when lefted with the spoon.

OVER MIXING WILL CAUSE MOST QUICK BREADS TO BE Tough

The small lumps which remain will take care of themselves during baking. When the batter is overstirred or beaten, everything goes wrong. The baked muffins will be small with peaked top and a smooth pasty-looking crust, plain color; when broken, the muffin will show tunnels (tube-like holes) running from the bottom up through the center; the texture will be tough and rubbery. Immediately after mixing, the batter should be placed in the pans in order to avoid loss of leavening gas. Muffin pans should be well greased on the bottom, but just lightly greased on the sides.

3 If the muffins cannot be baked immediately, they should be placed in the refrigerator; they should stand no longer than 15 to 30 minutes at the most. Whether to use the standard muffin method or cake method for combining ingredients is a matter of individual preference.

The muffin method is simple and gives the typical slightly coarse and open muffin texture; muffins prepared by the cake method have a finer, more cake-like texture and flavor. The muffin method is used for the plainer types of muffins; rich, sugar should be combined by the cake method.

Fill greased muffin pans 2/3rds full and bake in a hot oven (400°F.) for 20 to 25 minutes.

CORN BREAD

(IMPORTANT.)
SHORTENING SHOULD BE MELTED

Corn Bread is a product resembling cake, but instead of being as rich, light and sweet as cake, it has a distinctive flavor all of its own. It has the flavor of corn. Corn Bread contains a large portion of corn meal which is coarse ground corn. Corn Bread is mixed in the same manner as muffins; either by the standard muffin mixing method, or by the cake method of mixing. Richer corn bread should be mixed by the cake method (that is: those containing a large amount of shortening and sugar).

PIES

A pie is a combination of crust and filling. The quality of the finished pie will depend on the quality of each of these component parts; the pie will be good only if both crust and filling are good. As the crust and the filling are made separately, methods of making them will be described separately in this section.

PIE CRUST

A good pie crust can be made from flour, shortening, water and salt. Usually, however, other ingredients are added to impart certain characteristics to the crust. Glucose (white corn syrup), invert sugar or honey dried milk, and granulated sugar lowers the carmelization point (temperature at which browning occurs) and results in a crust with more color. In other words, when any of these materials are added, the crust brown at a lower temperature. The use of these materials is especially recommended when the bottom crust fails to brown properly. If glucose or white corn syrup are not available, an equal weight of granulated sugar may be substituted.

Shortening produces a tender crust. If the pie dough is mixed properly, the tenderness of the crust will depend on the amount of shortening used.

Based on the percentages of flour as 100%, the various ingredients of pie dough should fall within the average range as follows:

INGREDIENTS	PERCENT
Flour	100%
Lard, shortening, or oleo	50% to 75%
Salt	3% to 4%
Liquid (milk, water)	25% to 50%
Dried milk	0% to 5%
Invert sugar or honey	0% to 5%
Glucose (white corn syrup)	0% to 10%
Granulated Sugar	0% to 10%

The combined weight of waterand shortening should equal the flour weight. That is, as the shortening is increased, the water is decreased and vice versa; in other words, the amount of shortening used will determine the amount of liquid to be used.

MIXING THE DOUGH

Weigh or measure the flour and shortening and put into mixing bowl. Rub the flour and shortening together until all the shortening particles are reduced to the size of a small pea.

What we really want is particles of shortening coated with flour and that is what you will have if you do not over-do the combining. If a mealy crust is desired, the shortening and flour will require more mixing than for a flaky crust. In other words, the particles of shortening coated with flour will be similar.

Weigh or measure the water, sugar, and sale and dissolve the sugar ans salt in the water. Dissolving the sugar and salt in water insures an even distribution throughout the dough. The water should be cold. The water, sugar and salt is then added to the shortening and flour mixture. Mix together just enough to make a smooth dough. The liquid must be incorporated evenly into the shortening and flour mixture. If the dough is not mixed enough there will be raw spots in the bottom of the finished pie. It may be chilled before rolling. Chilling helps to make a flakier crust. Do not freeze the dough.

After the pie dough is mixed, place on a bench dusted with flour. Cut off a piece approximately five pounds, and roll into a strip about 3 inches in diameter. Cut in pieces about 7 to 8 oz. in weight for 9" pies, or 2-1/2 to 4 pounds for sheet cobbler.

TWO CRUST PIE MAKE UP:

To roll the bottom crust, place a piece of the cut pie dough on a table or a board lightly floured to prevent sticking. Do not use too much flour as a correctly mixed pie dough may still be turned into a touch, streaked, doughy crust by letting it take up too much flour during rolling.

Roll the dough quickly and lightly, always from the center out until the dough is one-eighth of an inch thick and slightly larger than the pie pan. As the folling pin approaches the edge of the dough on each storke, it should be lifted; never rolled on over the edge.

Rolling over the edge makes the edges thin; hence, it has a tendency to split. Any split that occurs should be pinched together before the rolling is continued. When the dough has been rolled to a shape and size to fit the pan in which it is to be baked, fold it in half and lift it carefully into the pan with the fold in the center. Unfold the dough and fit it smoothly into the pan so that there are no air pockets under the dough. The outer rim of the bottom crust is moistened with cold water. This is done to stick the top and bottom crusts together. A brush or a clean cloth may be used for this. After the rim of the bottom dough has been dampened, place about two pounds of filling required for a 9-inch pie in the bottom crust. Roll out the top crust in the same manner as the bottom crust. Fold the crust and dock or cut several gashes in the center to permit steam to escape during baking. Place it over the pie filling and unfold. After the top crust is on the pie, seal the bottom and top crust together with a fork or the fingers. Not until this is done should the excess dough be removed. The excess dough is removed by pressing with the hands against the rim of the pie pan. The excess dough should be used as part of the dough of the bottom crust for the next pie. Do not use scraps for top crust; always use fresh dough.

After the pie is made up, wash the top with milk or diluted egg, to give the crust a golden brown color.

Bake two crust pies in a hot oven, 400° to 424°F. for 40 to 45 minutes. The pie should be removed from the oven when the juice begins to boil out of the perforations in the top of the pie.

ONE CRUST CUSTARD PIE MAKE UP:

Roll the dough in the same manner as for the bottom crust of a two-crust pie. Fit the folled dough smoothly into the pan, being sure all air has been pressed out to prevent air pockets. Crimp the pie dough around the edge of the pie pan between the thumb and forefinger to remove excess dough, building the crust higher, thus making it possible to use more filling and produce a deeper pie. Place pans lined with dough for one-crust pies in the oven. Pour fillings for custard type pies. A 9" pie requires approximately one (1) quart of filling. Bake in oven of 400°F. approximately 15 minutes or until filling is firm to touch.

BAKED PIE SHELLS, CREAM PIE MAKE UP:

Roll the dough as for bottom crust of two-crust pie. Dock (prick) the dough with a fork. By docking the dough, a crust is produced which is uniform and free from blisters. Fit the dough smoothly into the pan. Remove the excess dough withthe palm of the hand. Bake in a hot oven 425° to 450°F. for 8 to 10 minutes or until golden brown.

PIE FILLINGS

There are essentially three types of dessert pie fillings. These are as follows:

(1) Fruit filling - apple, cherry, peach, mincemeat, etc.
(2) Custard filling which are placed in an unbaked pie shell and the two baked together -- pumpkin, egg custard, pecan.
(3) Soft cream fillings which are cooked separately and are poured into the baked pie shell -- chocolate, butterscotch, lemon, vanilla, coconut, etc.

FRUIT FILLINGS:

Are made with fruits, either fresh, fresh frozen, dried or canned. These fruits are sweetened and thickened enough so that the juice will not run over the plate when cut, but are not so stiff as to be paste.

There are several general rules which, if learned, will aid in preparing fruit pies. The procedure in preparing a fruit filling consists first of separating the juice from the fruit,thickening the juice with cornstarch, adding sugar and salt to the thickened juice, and finally adding the fruit. Do not store filling for any long period of time in metal containers as they will pick up metallic flavors.

The amount of starch necessary to produce the desired thickening depends upon several factors. First of all, all fruits are acid and acid tends to liquify the starch; therefore, the more acid in the fruit, the more cornstarch required to thicken the juice. Second, more sugar will be required. As a general rule, the amount of starch is 5 to 6 percent of the total syrup; the juice, water and sugar should total 94 to 95 percent. As a general rule, 1 to 3 pounds of sugar should be used for one No. 10 can of fruit; depending on the acidity of the fruit, the more acid the fruits have, the more sugar the fruit requires.

All cooked fruit fillings should be chilled before they are placed in the pie. The filling should be chilled as rapidly as possible. This preserves the natural color of the fruit. The use of a cold filling prevents the breaking down or melting of the pie dough; also, the use of a cold filling increases the time before the filling boils over in the oven. There is, therefore, less chance for the filling to boil over the crust before it is baked.

CUSTARD TYPE FILLINGS

A good custard pie filling resembles a good fruit jelly in that it is tender and quivery, yet it keeps its angle when cut and does not "weep" on standing. Furthermore, it has a delicate golden brown surface entirely free from the heavy dark brown layer some times observed on this type of pie. The chief difficulty encountered in making custard pie is the baking.

If the temperature of the oven is high, the filling will tend to weep; whereas, if it is low, the filling will soak into the crust. One method of overcoming this difficulty is to use a combination of baking temperatures; a hot one for just long eough to start baking the crust, but not long enough to overheat the filling. Then a low one to finish baking both the crust and the filling. Pumpkin pie filling resembles custard in its general characteristics. It has more body, however, and, therefore, a requirement in the preparation of the pumpkin filling is that the pumpkin be baked the same as custard partly because the filling is more stable to the high initial temperature required for cooking thecrust, and partly because the pumpkin mixture, being somewhat thicker than the custard, has less tendency to soak into the crust.

Custard-type pie fillings usually are made by placing sugar, salt, and spice in a mixing bowl, adding the eggs and stirring briskly with a wire whip to dissolve the sugar and cut up the stringiness of the eggs. The eggs in the custard causes the filling to set and become firm. Sometimes a small amount of cornstarch is added to help prevent the custard from weeping after it is baked. The milk is then added and stirred well; and, last, the melted butter is added to help prevent the custard from weeping after it is baked. The milk is then added and stirred well; and, last, the melted butter is added. This filling should be allowed to set long enough to work off foam which has been developed during mixing. Otherwise, if this is not done, spots will result on the finished pie. In making pumpkin pie, the pumpkin is added after the eggs have been mixed with the sugar. Making custard pies during the hot summer months is not recommended due to the fact that if not handled properly, food poisening may result.

SOFT CREAM TYPE FILLING

Cream fillings, including chocolate, lemon, vanilla, butterscotch, coconut, and those containing such fruits as pinapple and bananas, should be stiff as to be pasty, as indicated by its tendency to hold its cut edges rigidly. Suchfillings, moreover, should be perfectly smooth with all the ingredients so well blended together that there is not the faintest suspicion of lumpiness.

In the event that the filling does become lumpy during cooking, if the filling is beaten while it is still hot, the lumps can be beaten out. Finally, there should be no flavor of raw starch in the cooked fillings. In order to obtain such a filling, it is necessary to juse just the proportion of starch and eggs called for in the directions, to cookthe mixture carefully in a double boiler or copper; and, to stir constantly during cooking until it thickens. In making cream fillings, the milk or liquid flavor and the sugar are placed in a kettle and brought to a boil. Then, the corn starch is dissolved in a little cold water until smooth and free from lumps. The corn starch mixture is then slowly poured into the boiling liquid, stirring constantly while adding the starch. Take a small amount of hot mixture and add to the eggs, then add the eggs to hot mixture.

COBBLERS

A cobbler is nothing more than a large pie. The same crust and filling which are used in ordinary pies can be used to make cobblers. To make a cobbler, use a regular 18" x 25" sheet pan. Roll out the dough with the rolling pin and place on the pan. Mash edges of the dough as when making ordinary pies. Place 10 to 12 lbs. or 5 to 6 quarts of filling in the bottom crust. Roll the top crust making sure to dock it in order to allow the vapor to escape during baking. Seal top crust to bottom crust and trim off excess dough. Wash with egg or milk and bake in the same manner as two-crust pie.

Control of Temperature in Pie Baking:

The correct oven temperature in pie baking is of most importance. Following are some of the factors to be considered in attaining the best results:

a. Pie crust browns at a lower temperature if sugar or a similar carmelizing ingredient is added.

b. Two-crust pies should be baked in a hot oven (400°F. to 425°F.)

c. Custard-type pies should be baked at 400°F., approximately ten minutes, the heat reduced to 350°F. and baked 15 minutes or until filling is firm.

d. A pie shell should be baked at 450°F for 8 to 10 minutes until golden brown.

e. An excessively hot oven causes the pie crust to shrink.

f. Under-baked bottom crusts result from insufficient heat in bottom of oven.

g. A cool oven temperature may cause the filling to boil out.

PIE FAULTS AND REMEDIES

In the best galleys, there are times when the finished pie falls short of the good standard. Many of the difficulties encountered in making good pies may be overcome by careful handling in mixing and by following a few simple rules in baking. The following information tells how to correctthe common faults in pie making.

Shrinkage of Crust During Baking:

1. One of the principal causes of shrinkage is improper coating of the flour with the shortening. When the flour is improperly coated, it takes on water readily during the mixing period. This allows the gluten of the flour to develop and results in shrinkage of the crust in the oven.

2. An excessively hot oven also causes the crust to shrink.

c. Shrinkage also results when an excessive amount of liquid is ued. The pie dough becomes soft and requires extra mixing to obtain a smooth dough; as a result, some of the gluten in the flour is developed which causes shrinkage during baking.

Tough Crusts:

1. A tough crust will result if insufficient shortening is used in the pie dough.

2. A tough crust may be due to improper coating of the flour with the shortening.

3. Another and the most common cause of tough crust is overmixing the dough after the water has been added to the flour and shortening.

4. Toughness may be caused by the use of excessive amounts of water.

5. A strong flour tends to cause a tough crust.

6. As a general rule, the factors which cause shrinkage also produces tough crusts.

Filling Boiling Out:

The boiling point of pie fillings is determined by the percentage of sugar in the finished fruit mixture. The more sugar in the mixture, the higher will be the boiling point. Consequently, the sweeter the pie, the longer the time it can stay in the oven without boiling out.

1. Boiling out may be caused by using too hot a filling. The colder the filling, the longer will be the time required for the filling to heat and boil out; therefore, there is less chance of boiling out if the filling is cold when placed in the pie.

2. A long baking period in a relatively cool oven allows the filling to be heated to the boiling point before the crust is properly baked. A low oven temperature, therefore, is a cause of boiling out. If it is necessary to use a slow oven, the amount of carmelizing material (such as sugars) in the pie crust should be increased. This tends to make the crust brown just before filling reaches the boiling point. At this point, the pie will be sufficiently baked and should be removed from the oven.

YEAST DOUGHS

Variety in everything is the demand of the day and innothing is this so true as in food stuffs. In this respect, yeast doughs have a most important place in the service menu and the cook as well as the baker should have a fundamental or basic knowledge of yeast doughs in order to make and serve yeast dough products often.

In order to be skilled in the making of yeast doughs, the baker must know the nature and the function of yeast doughs, the process involved in the manufacture of yeast dough formulas and how to use them, and how to correct yeast dough faults.

The following information can serve both as a text book for training and as a handy reference book to enable the baker to improve his products:

TYPES OF YEAST DOUGHS

Practically all yeast doughs are very similar as far as ingredients, but vary greatly in their make-up to finished products. For purposes of classification, yeast dough in the service mess falls into three different types. The types and their uses are as follows:

1. Bread Doughs
    (a) White Bread.
    (b) Rye Bread.
    (c) Whole Wheat Bread.
    (d) Raisin Bread.

2. Basic Plain Roll Dough
    (a) Plain Rolls.
    (b) Parker House Rolls.
    (c) Clover Leaf Rolls.
    (d) Finger Rolls.
    (e) Hamburger Rolls.

3. Basic Sweet Rolls
    (a) Sweet Rolls.
    (b) Butterfly Rolls.
    (c) Twist Rolls.
    (d) Snail Rolls.
    (e) Coffee Cake Rolls.
    (f) Doughnuts.

INGREDIENTS

The baker must have a knowledge of the nature, characteristics, and functions of the ingredients needed for yeast leavened doughs. Yeast dough is more than putting a mass of ingredients in a pan and baking it. The chemical changes that take place during fermentation, the effects of temperature and moisture upon the process, and the method of handling the dough, determine the quality of yeast dough products.

Slight changes in the amount of the ingredients or in the dough making process also effect the quality of the finished products.

If one understands the part each ingredient plays in the finished product, he is able to improve the yeast dough product's quality by making the proper changes.

The basic ingredients are those which must be available if yeast leavened products are to be manufactured. These basic or minimum essential ingredients are:

1. Flour, hard wheat
2. Water
3. Yeast
4. Salt

While yeast dough products can be manufactured by using only the basic ingredients, enriching ingredients must be used if the products are to meet high standards. The use of this group of ingredients, called the enriching ingredients, results in products with improved appearance, better keeping qualities, tender crumb, and higher nutritional values. The additional ingredients, sometimes but not always used, include the following:

1. Sugar
2. Shortening
3. Milk
4. Eggs
5. Malt
6. Flavor and spices.

FUNCTION OF INGREDIENTS

In order to secure yeast dough products of highest quality, it requires a complete understanding of the nature of each ingredient and the part or function which it plays in the production of yeast dough products.

1. Wheat Flour - Wheat is the only flour that when used alone will make satisfactory yeast doughs; no other flour can take the place of wheat flour in yeast doughs. This is due to the fact that wheat flour is the only flour known to man containing the proper combination of the two proteins -- gliadin and glutenin -- which, in the presence of water, combine to form gluten that elastic, tenacious substance which holds the gas produced by the action of yeast on sugar. This gluton is the necessary skelitan or framework of yeast doughs, forming the sustaining walls of the whole cellular structure of yeast dough products. It is flour that provides the structure for all yeast dough products. This is its most important function.

In the service mess and bakery there are two types of wheat flour available for use. The two types are hard wheat flour and soft wheat flour. Hard wheat flour is higher in protein content; therefore, it is most desirable for use in yeast dough products. Soft wheat flour is low in protein content and is not desirable for yeast dough. It is more suited for pastries such as cakes, pies, and cookies.

2. Water - Water is a basic ingredient in yeast doughs. Without water the formation of dough would be impossible. When mixed with flour, water united with gliadin and glutenin of the flour to form the structure of yeast doughs.

Water determines the consistency of dough. The amount used will determine if you will have a stiff or slack dough. Water assists in the control of dough temperature which is important in regards to fermentation of dough.

With the exception of the flour and the shortening, the other ingredients used in yeast doughs are dissolved by the water.

3. Yeast - Yeasts are microscopic plants which multiply by budding and whichm under suitable conditions, causes fermentation by converting sugar into alcohol and carbon dioxide gas.

Yeast performs the following functions when used as a dough ingredient. It causes fermentation which gradually converts the heavy mass of newly mixed dough into a light, porous structure, which when baked is appetizing, easily digestable and nutritious.

4. Salt - The salt used in baking is known chemically as sodium chloride, which is the common salt universally used by everyone as a mineral food in order to supply the body tissues and fluids which they require. The function of salt in a yeast dough is to bring out taste and flavor.

Salt used as an ingredient stimulates the taste nerves and brings out the natural flavor of yeast dough products. Salt also regulates and controls the fermentation. Salt has a retarding effect on the fermenattion. At the same time, salt promotes the development of a health fermentation by checking the growth and activity of any undesirable yeast or bacteria which may have gained access to the dough. In this way when salt is used in proper amounts, it aids in checking the development of any undesirable or excessive acidity.

5. Sugar - Sugar is not an essential ingredient for yeast doughs, but when used provides an immediate source of food for yeast activity. It is the sugar in the dough which is acted on by the yeast, forms carbon dioxide which raises the dough.

While flour contains a small amount of sugar, the addition of sugar in greater or lesser amounts is necessary in most doughs. Sugar is also a source of sweetness and it helps give color by carmelizing during the period of baking, which gives the golden brown color and flavor to the crust of the product.

6. Shortening - Shortening refers to the fats or oils used in baked goods. Shortenings ordinarily used for baking purposes are edible fats of animal origin. The dividing line between these fats and oils is not very definite. In general, shortenings which are fluid at ordinary temperatures are called oils, and those which are solid are called fats. The shortenings available in the service mess are butter, oleomargarine, lard, and hydrogenated shortenings. These are the following functions in yeast doughs: It makes the crust tender, keeps products moist and improves keeping qualities, renders the crumb soft and chewy, and provides additional nutritional value to the products.

7. Milk - The single word milk unqualified, refers to liquid whole milk secured from cows. The types of milk available are liquid whole milk, evaporated milk, and dry or powdered milk, both whole or non-fat.

8. Malt - Malt sirup is a concentrated product made from barley malt and other cereal grains. When used in yeast doughs itprovides immediate food and minerals for the yeast to stimulate fermentation, acts as a sweetening agent, brings out flavor, and improves color of the product.

9. Eggs - Eggs when used in a yeast dough adds richness, flavor, improves texture, adds color and greatly increases the nutritional value of the product.

PROCESSES IN MAKING YEAST DOUGHS

Yeast doughs, in order to ferment properly, must be mixed in a definite temperature range. It has been found that best fermentation occurs when the doughs are mixed at temperatures from 78° to 82°F. These are the usually preferred temperatures. To determine the desired water temperature follow these steps:

1. Multiply the desired dough temperature by 3. (80°F x 3 = 240°F.)

2. Add the temperature of the room, temperature of the flour, add the amount of temperature in the dough caused by the friction of the mixing.

This temperature will vary. For hand mixing 10°F. is generally the correct amount of friction to figure, but the speed and the time the dough is mixed on the mixing machine determines the amount of friction. In the messhall, the amount is usually between 10° to 30° on the vertical mixing machines:

Temperature of Shop	75°F.
Temperature of Flour	73°F.
Friction Rise	10°F.

3. Subtract the figure obtained in Step 2. from figure obtained in Step 1. The result (in this example, 82°F.) is the temperature of the liquid to be used in mixing the dough. (240° - 158° - 82°F.)

4. If the result obtained in Step 3. indicates that the temperature of the liquid must be over 100°F. then that part of the liquid which is used to suspend the yeast must be left at a temperature of not more than 90°F. The temperature of the remainder of the liquid should be raised accordingly. This applies if you are using compressed yeast.

MIXING PROCESS

Ingredients for yeast doughs are mixed by machine mixers or by hand. Thorough mixing of dough is important for several reasons:

(MIXING)

(1) To distribute the yeast cells throughout the dough.
(2) To smooth the mass of ingredients and free it of lumps.
(3) To distribute the food for the yeast.
(4) To form and develop gluten.

Mixing induces the formation and development of gluten by bringing moisture in contact with the gluten forming protein in the flour. Thus, for satisfactory development of gluten, all particles of flour must be thoroughly wet. Absorption qualities of flour vary widely and for this reason the exact amount of water being used is variable.

As mixing continues, all dough ingredients stick together and more and more gluten is formed until a complete gluten network is developed in the dough. The mixing process of pulling and folding the dough mass in continued until the gluten particles are arranged into somewhat of a paralled pattern which accounts for the smooth appearance of a well-mixed dough.

There are many ways to mix a yeast dough in order to accomplish the above objectives. A suggested method or use in messhalls is a straight dough mixed in the following steps:

(a) Cream the sugar, shortening, and salt to a smooth paste. Be sure that all lumps have been worked out of both sugar and shortening during the creaming process.

(b) If eggs are used, add to the creamed sugar and shortening and mix in a few at a time.

(c) After the eggs have been thoroughly mixed into the sugar and shortening, add the milk, and water to which the yeast has been dissolved, and mix thoroughly.

(d) If flavors or spices are to be used, they should be added at thisstage.

(e) Add the flour all at one time and then mix until the ingredients stick together to form one dough mass. A properly mixed dough will clean up the mixing bowl and the dough will not be sticky.

1 ½-2 Hrs. FERMENTATION TEM 80° REL. Humity 75%

Fermentation starts immediately after yeast is put into the mixture. This chemical change or action continues until the yeast is killed by the heat of the oven. However, the fermentation period, as the term is generally used, is the time between mixing and dividing the dough. Punching of the dough is included in this period.

1. Purpose:

(a) Leavening the dough is the primary purpose of fermentation. Leavening is the result of a chemical action that creates carbon dioxide, when caught in the gluten network, expands and causes the whole dough mass to expand.

(b) Maturing or ripening the dough is the secondary purpose of fermentation. This is the result of changes in the combination of starch and gluten that enables the dough to absorb and retain more water and to stretch more effectively. This secondary action makes the dough spongy and results in light, easily digested products. Fermentation is of the utmost importance in order to condition the dough.

2. Effect of Temperature:

All four types of fermentation discussed below takes place in yeast dough. The quality of the baked product is impared because of the undesirable types of fermentation. Thus, to insure an alcoholic type fermentation, it is recommended that doughs come from the mixer between 78° to 82°F. If inadvertently, because of uncontrollable factors of weather or equipment, a dough is mixed at a higher temperature, an edible product may still be produced by shortening the fermentation period.

(a) Alcoholic Fermentation: Alcoholic fermentation, the type desired in yeast dough products, occurs to best advantage between the temperatures of 78° to 90°F. In alcoholic fermentation, yeast converts sugar into approximately equal parts of carbon dioxide and alcohol.

(b) Acetic Fermentation: In acetic fermentation, acetic bacteria (present in flour) converts diluted alcohol into acetic acid (viniger). Conditions favoring acetic fermentation are doughs mixed and fermented at relatively high temperatures (90° to 95°), prolonged fermentation, and carelessly folded doughs.

(c) Lactic Fermentation: In lactic fermentation, the lactic bacteria converts sugar into lactic acid. Such fermentation, usually occurring between 95° to 98°F., causes milk to sour and may produce undesirable results in the flavor of theproducts.

(d) Butyric Fermentation: In butyric fermentation, the butyric acid bacteria break down the fats in the dough and thereby imparts the unpleasant flavor and tast e of rancid butter to the product. This undesirable type of fermentation occurs at very high temperatures, approximately 104°F. Hot doughs that are allowed to ferment for long periods of time in hot places may cause butyric fermentation.

3. Effect of Humidity: Relative humidity is the ratio of the quantity of vapor actually present to the greatest amount possible at the given temperature. The amount and the rate of escape of moisture from dough effect both the quality and consistency of the dough; the relative humidity is very important in yeast doughs.

4. Fermentation Time Before Punching: Because fermentation time bevaries, doughs must be tested at intervals during fermentation. The time for punching may be determined by inserting the fingers gently into the top of the dough to a depth of 1 or 2 inches and observing

the dough closely when the fingers are withdrawn. When the proper fermentation stage for punching has been reached, the dough will neither collapse or spring back out but will sink slightly around the depression. If the indentation caused by the fingers tends to spring back, the dough is not ready for punching. If the surface of the dough falls rapidly, the proper time for punching has already passed and the dough should be punched at once.

5. Punching: When the proper time for punching has arrived, usually one and one-half to two hours, press the dough by hand and fold it from bottom to top and from side to side until most of the carbon dioxide and alcohol is expelled.

Bring the top and the sides into the middle and then turn the dough over completely so that the part of the dough that is on the bottom is broughtto the top. Never punch by simply knocking down the dough. A properly punched or folded dough will result in the following:

(a) The temperature of a dough has been equalized which will aid in bringing about a thorough and uniform fermentation.

(b) Some of the carbon dioxide gas and alcohol that was formed during the fermentation process has been expelled.

(c) After its constant tension, during the period of dough expansion, the gluten has been relaxed. This relaxation period will give the gluten a chance to strengthen and develop.

6. Fermentation Time After Punching: After punching the dough, leave it set to permit it to recover from the punching. In the fermentation period that follows the punching, the dough again rises and the gluten continues to ripen. The length of this recovery period depends upon fermentation ratio. In basic sweet doughs and basic roll doughs, the recommended time is approximately 15 to 30 minutes.

MAKE UP

When the dough is properly fermented it is ready for makeup. Makeup consists of dividing, rounding, bench proofing, molding, and shaping and panning. The dough should be divided into equal size pieces, depending on the space and ability of the baker to handle the dough. It should then be folded into oblong shapes or rounded in a firm ball with a smooth unbroken skin over its entire surface. The unbroken skin will retain the gas that will be generated during the bench proofing. This gas will give the doughpiece workability for easier shaping and molding.

The dough is given a short rest period before it is molded or shaped into individual products, to allow the dough to recover from the effects of dividing and pounding. This period is referred to as Bench Rest or intermediate proofing period. Without this proofing period the dough is yet too rubbery and will be difficult to make into individual products. The bench proof usually requires 12 minutes; but, it may vary from 10 to 15 minutes depending on the dough and temperature conditions. To prevent a piece of dough from crusting on the surface, make sure they are all covered and free from all drafts. Upon completion of the bench rest, the dough pieces are made up into any of the many products made from basic roll dough and the basic dough.

1. Basic Plain Roll Dough Products Make-up:

(a) Plain hot roll. Roll out dough into elongated strips 1-1/2" in diamater. The strips are then divided into rolls approximately 1 to 2 ounces each. Round the pieces of dough into balls about the size of a golf ball by the process of rolling them with a circular action against the work bench. Space the buns on a greased baking pan.

(b) Parker House Rolls. Roll out the dough piece onto the bench into elongated strips 1-1/2" in diameter. Divide dough into approximately 1 to 2 ounce pieces. Round the pieces of dough into balls about the size of a golf ball by the process of rolling them with a circular motion against the work bench. Allow the rounded rolls to rest for a period of 10 minutes. Then grease or oil them by brushing with either melted butter or oils. Place the rolls greased side up and crease them across the center with a small rolling pin or hand. Then fold the rolls on the crease and place in pans so that the folded portion will be visible on the baked roll.

(c) Finger Rolls. Roll out the dough piece into elongated strips about 1-1/2" in diameter. Divide the dough into pieces weighing from 1-1/2 to 2 ounces, roll the dough pieces into an elongated shape, similar to a cigar or your finger approximately 4 to 4-1/2 inches long. The rolls should be placed about 1/2 inch apart in greased pans.

(d) Clover Leaf Rolls. Roll out the dough piece into elongated strips about 1-1/2 inches in diameter. Divide into approximately 1/2 ounce pieces. Round the pieces into balls and place 3 balls in each section of agreased muffin pan.

(e) Hamburger Rolls. Roll out the dough piece into elongated strips about 1-1/2 inches in diameter. Divide the dough into approximately 2 ounce pieces, round the pieces into balls by rolling in a circular motion while pressing the dough piece againstthe work bench. Place the rounded pieces on a greased bake pan, allowing 1-1/2 to 2 inches between the rolls. Allow the rounded pieces of dough to proof for 10 to 15 minutes. Then flatten the dough pieces producing a bun of a larger diameter and less thickness. Care should be taken not to force the finger into the dough as this would produce cavities or holes.

2. Basic Sweet Dough Products Make-up:

(a) Sweet rolls. After bench proofing, roll dough piece with a rolling pin into a sheet about one-half inch thick and 16 inches wide. Brush the top surface of the rolled dough lightly with melted butter, oleo, or shortening, and sprinkle with sugar, spices, nut chopped fruit, cake crumbs, or any appropriate filling. Starting at the top of the rectangular surface, make a tight roll and keep on rolling toward the bottom, care being taken to insure that the roll is of the same diameter throughout its length. To assist in securing properly, seal the bottom edge of the dough by brushing or dampening with water. Seal the dough by use of the knuckles or heel of the hand. The dough is now in the form of a long curled strip. Using shart knife or dough cutter, cut the strip into 2 ounce pieces, place the cut pieces in a greased pan so spaced as to distribute evenly the pieces in the pan, usually 6 along the width by 8 along the length.

(b) Butterfly rolls. Same procedures as for sweet rolls up to and including cutting into 2 ounce pieces. Press down through the center of an uncut surface of each piece. This action will cause the cut surface to curl up and form a characteristic butterfly shape. Pan 4 x 6.

(c) Twists. Roll dough piece into a sheet similar to that used for sweet rolls. Brush with melted shortening and cover with desired filling. Fold the dough forming 3 layers. Cut the folded dough strips crosswise with a knife and scrape into pieces as to produce a twisted effect. The twist is completed by rolling the dough piece in one direction with the left hand and in the opposite direction with the right hand. Pan off in greased pans by 4 x 6.

(d) Snails. Same procedure as for twists up to and including cutting into 1-inch strips and twisting. After the strip of dough has been twisted, it is then coiled and the outside is sealed. They are panned ingreased pans 4 along the width by 6 along the length.

(e) Coffee Cake. Roll out a 4 pound piece of dough sufficiently large to fill 18-inch by 25-inch sheet pan. Coil the dough around the rolling pin. Then uncoil the dough by reverse action. Then dock (prick) the dough sheet with a fork toprevent blisters. Brush lightly with water or melted butter and cover with streusel, butter topping or any type of thickened fruit filling.

(f) Doughnuts. Roll dough piece into a sheet pan one-half inch thick. Cut into doughnot shape by use of a doughnut cutter. Place the cut doughnuts on pans that have been dusted with flour but not greased. Do not place the doughnuts too close together as this makes them difficult to remove from the pan.

PAN PROOFING

After the products have been made up, before they can be put into the oven or deep fat, they must be pan proofed or allowed to rest under controlled conditions of temperature and humidity. The ideal atmospheric conditions of the proofbox are a temperature of 90° to 100°F. and a relative humidity of 80 to 85 percent. The time for pan proofing varies from 30 to 60 minutes. The products should be allowed to proof until double in size. Panproofing enables the made-up dough products to obtain proper volume and gives the gluten in the dough a final mellowing.

It restores lightness to the dough and insures proper oven spring, thereby improving the grain and texture of the products.

BAKING

At the end of the panproofing period, the panned products are transferred quickly, but carefully, to the oven for baking. Undue delay or careless handling at this point will dimage the finished product. In other words, the product may fall and become heavy, small in volume, and of poor texture. The temperature of the oven should be 400° to 450°F. The baking period will vary with the type and size of the products. The products should be baked until golden brown on top and bottom, usually this takes place in 15 to 30 minutes.

During the first few minutes of the baking process, the carbon dioxide gas within the dough expands. This expansion causes a very rapid rise in the dough known as oven spring. Fermentation is more vigorous and more rapid at this stage than at any previous stage involved. When the inside temperature of the product reaches 140°F the yeast is killed and fermentation ceases. The alcohol produced by the action of the yeast on the sugars in the dough quickly evaporated and during the baking process escapes from the dough in the form of vapor.

After the oven spring, the pliability of the dough gradually lessens, and the dough becomes set and slowly changes to bread, buns, etc. Some of the moisture passes off. The starch becomes gelatanized and more digestible, and the gluten and other proteins become coagulated. After the produce is set, the intense heat dries out the part exposed to air and causes a crust to form. Coloring of the crust starts 10 to 15 minutes after the products are in the oven. The golden brown color of the curst is the result of chemical changes in the starch and sugar known as carmelization. Intensity of crust color depends upon the oven heat and the amount of unfermented sugar in the dough. Insufficient heat or sugar causes a rubbery crust.

CAKES

Cake is baked batter made from sugar, shortening, eggs, milk, flour, and leavened either by chemical leavening agents or by a physical means, mixed together in such a way as to produce a fluffy fine grained baked product.

The really "excellent cake" has certain characteristics which are difficult to describe. These, for want of better words, we call "velvetiness" and "featheriness", meaning by the first that it almost has the feeling of soft velvet to the tongue or fingers, and by the second that it has a structure so delicate that it almost melts in the mouth. Cakes which have these characteristics are always very light and of a fluffy, even grain, which is to say that for the most part they have small holes evenly distributed. These qualities, though, do not insure the velvety feeling. They must be present and either or both of the other lacking. In addition, it may be added, this ideal cake has a delicate flavor not masked by over-sweetness.

TYPES OF CAKES

Cakes are divided into two distinct types, as follows:

1. Batter-Type Cakes
    a. Plain yellow cake
    b. Devil's food cake
    c. White cake
    d. Spice cake
    e. Upside-down cake
    f. Marble cake
    g. Cottage pudding
    h. Boston cream pie
    i. Cup cakes
2. Foam-Type Cakes
    a. Angle food cake
    b. Sponge cake
    c. Jelly roll
    d. Mary Anns

Batter Type Cakes

Is a cake that requires the use of shortening (butter, oleo, lard, shortening) and a chemical leavening agent (baking powder or soda).

Foam Type Cakes

Is a cake that requires no shortening and no chemical leavening agent. This type of cake demands primarily air that is incorporated into the egg structure to cause the cake to rise. This is called physical leavening.

INGREDIENTS AND THEIR FUNCTIONS

In order to make cakes satisfactory, it is necessary to know the ingredients and their functions.

Flour: Flour used in cake making should be of a soft wheat variety. Soft wheat flour has less tender protein than hard wheat flour. Cake flour has been treated during the milling process to enable it to produce a better quality cake. Soft wheat flour may be identified by its white color, smooth feel and its ability to pack easily when squeezed. In normal cake making soft wheat flour will be used. In the event it is necessary to use hard flour in cake, substitute up to 10% of the hard flour with corn starch. This will lower the protein content and help produce a cake of better quality. The functions of flour in cake are to:

1. Build the structure of the cake, its grain and texture.
2. Stabilize the emulsified batter.
3. Aid in holding the other ingredients together.
4. Absorb and hold moisture.
5. Contribute to the body and form of the cake.
6. Contribute food value to the cake.

Sugar: In making cake it is necessary to dissolve the sugar completely; therefore, a fine granulated sugar is best. Sugar has the following functions in cake making:

1. Sugar is used to sweeten the cake.
2. Since sugar crystals are perfect cubes, the sharp corners of these cubes have a tendency help cut air into the cake batter during the mixing period, thus helping to make the cake light.
3. Sugar has a tenderizing effect on the gluten developed in the flour, and thus should be classified as a tenderizing ingredient.
4. Sugar helps to retain the moisture in the finished cake.
5. Sugar helps control the color of the curst in the finished cake.
6. Sugar adds food value.

Shortening: Refers to edible fats of animal or vegetable orgini used in baked goods. Butter, oleomargarine, lard, vegetable shortenings, are the shortenings used in cake making. The emulsifier type (Type 11) is best suited for cakes. This type of shortening allows the use of more liquid and in turn allows the use of more sugar. When emulsified shortening is not available the liquid and sugar going into the cake must be reduced. In other words, with high-ratio cakes (cakes that contain more sugar than flour) should always be made with Type 11 shortening. The functions are:

1. Shortening makes cake tender because it has a shortening action on the gluten developed in the flour during mixing of the cake batter.
2. Shortening helps to incorporate air in the batter by taking in air during the mixing period. The amount of air incorporated in the batter governs the fineness of grain, as well as the tenderness, and helps to control the volume of the finished cake.
3. Shortening, especially "high-ratio" shortening helps to emulsify the liquids added to the cake batter.
4. Shortening increases the keeping qualities of the finished product.
5. Shortening may or may not add flavor. If shortening such as butter or oleo is used, flavor is added. A neutral shortening is tastless and does not affect the flavor.
6. Shortening adds food value to the finished cake.

Eggs: Generally speaking, without eggs there would be no cake. They are the major factor in giving cake its dominant characteristics, which differentiate cake from other baked products. Eggs add structure to the finished cake because egg proteins coagulate during baking and assist the flour in supporting the heavy weight of the other ingredients. Contrary to the common belief, eggs do not cause a cake to rise. It is the air that has been whipped into them. This air is the factor which causes foam or sponge type-cakes to rise and become light during baking. The functions of eggs in cake are as follows:

1. Eggs help build the structure of the cake; this structure helps to carry the tenderizing ingredients, such as sugar, shortening, and chemical leavening.
2. Eggs add moisture to the finished cake.
3. Eggs add color. Whole eggs and yolks definitely add color to the finished cake.
4. Eggs help bind the other ingredients together causing an even distribution of the ingredients. The tendency of eggs -- whole, whites, or yolks -- to hold together as an emulsion the other ingredients of a cake batter, the sugar, fat, flour and the moisture, is mainly responsible for the formation of the classic cell structure that permits even expansion of a cake batter. This even distribution produces a smooth batter which is essential in producing a good cake for if batter separates, the results obtained in the finished cake will not be satisfactory.
5. Eggs add food value to the cake.

Moisture: Moisture in some form is necessary for all baked products. This moisture comes from water, liquid, milk, and moisture in the eggs that are added to the mix. Cakes are generally made with milk although, in the case of devil's food cake, milk is not so desirable, as it is difficult to obtain a deep red color in the finished product. This is due to the fact that milk owers the carmelization point of the cake and the crust color is brown instead of red. Moisture (water and milk) has the following functions in cake baking:

1. To control the consistency of the finished cake batter.
2. A certain amount of liquid is necessary to dissolve the sugar which is added to the cake. If the sugar is not dissolved, a spreading action from the sugar results during the baking period causing the structure of the cake to overstretch and the finished cake to collapse in the center. When too little liquid is used in the cake batter, there is not enough liquid to properly develop the gluten in the flour and thus obtain the desired structure. Based on the flour as 100%, the combined weight of the eggs and liquid in white and yellow layer or sheet cakes should be 20 to 30 percent more than the percentage of sugar. In devil's food cake, it should be 40 to 60 percent more than percentage of sugar.

3. To impart color to the crust, the amount of milk solids in cake batter should be regulated. The crust color of the cake can be controlled because milk solids contain a high percentage of lactose (milk sugar) which carmelizes at approximately 270° to 275°F. This carmelizing temperature is well below that used in baking cakes.

4. To improve the keeping qualities of the finished cake because milk solids help to retain moisture.

5. To add flavor to the cake.

6. To add food value to the cake.

Leavening: There are three factors which cause leavening, or the cake to rise. They are as follows:

1. A chemical leavening, such as baking powder, soda and buttermilk, or soda and an acid of any kind, is used to leaven batter-type cakes. During the baking period the chemical leavening gives off carbon dioxide and the gelatinous material in the cake, such as the egg and the gluten developed in the flour, holds this gas and causes the cake to rise. When baking is done at high altitudes, the amount of leavening should be reduced because of decreased atmospheric pressure.

2. Air which is incorporated in the batter has a leavening effect and is called physical leavening. It is the only leavening used for making foam or sponge-type cakes. When air is warm it has a tendency to expand and this expansion causes the cake to rise. The air mixed into the cake batter carries the vapor which is developed during the baking period and allows it to circulate through the cake and out through the top. If the cake batter does not contain enough air and does not rise properly, this vapor cannot work through the cake properly during the baking period. It finally will work out through the bottom of the cake and build up pressure forcing the cake up and causing a pocket on the bottom. It is apparent, therefore, that a certain amount of air in the cake batter is necessary. The air in layer cake is responsible for 40 to 50% of the finished cake volume.

3. Vapor pressure also causes the cake to rise. The reason this is called vapor pressure rather than steam, is that during the baking period, the inside of a cake never reaches a temperature of over 208 to 210°F and steam is developed at 212°F.

CAKE FORMULA BASED ON FLOUR AS 100%

Flour, soft	100%
Sugar	100 to 150%
Shortening	40 to 60%
Eggs	must exceed shortening by 10 to 35%
Liquid (milk/water)	combined with eggs must exceed sugar by 20 to 60%
Salt	1 to 3%
Chemical leavening	5 to 6%

FLAVORING:

Cocoa ---0 to 30%

Extracts --0 to 1.5%

MIXING METHODS OF BATTER CAKES

In cake making, the care and manner of mixing is as important as the materials and formulas themselves.

In discussing the general subject of cake mixing, it is possible only to lay down certain basic principles regarding the manner of incorporating the cake materials together. Certain minor variations may be desired in special individual formulas in order to produce the best results, depending on the nature and proportions of ingredients and the type of finished cake desired. Therefore, the exact method of handling each specific formula in order to secure best results should be determined and followed. As a matter of fact, no formula is really complete unless it includes a description of the manner in which the ingredients should be mixed. The reasons for mixing cake should be kept in mind at all times. They are to get all of the ingredients smoothly mixed together and to get air incorporated in the mix. This can be done by using either of the following methds of mixing:

1. Creaming method.
2. Two-stage method. The most preferred.

CREAMING METHOD

This method is the standard or conventional method of incorporating the cake ingredients.

GENERAL MIXING PROCEDURE

Carefully weigh or measure the exact proportion of ingredients. The temperature of the flour, sugar and shortening, and eggs should be about 70° to 78°F. Thoroughly blend the baking powder with the flour, sift several times so that a homogenous uniformmixture of the two will be secured.

Cream the required amounts of sugar, salt and shortening called for in the formula.

The eggs should be first stirred just enough to blend thoroughly the yolks and whites. After the creaming of the sugar and shortening has been in progress for several minutes, the eggs should be gradually incorporated into the creamed mass. This is best done by adding the eggs in several small portions with continuous creaming. At this point, there is sometimes a tendency for the creamed mass to break down or curdle. To prevent this, a small portion of flour is added either after the first portion of the egg is incorporated, or at the beginning of the creaming process.

Having the eggs at room temperature, as previously mentioned, will also aid in this respect; however, the milk and eggs should not be too cold for too great a difference between the temperature of the creamed sugar and shortening mass and the added liquid is claimed to encourage rather than prevent curdling. Creaming is continued until maximum volume of the creamed mixture is obtained.

Liquid milk, if used, is next added carefully and gradually. It is often found advisable to add another small portion of the flour after the first part of the liquid is incorporated.

As soon as all liquid is added, the remaining flour containing the baking powder should be slowly drawn into the mix until it is entirely incorporated and a smooth, uniform batter is obtained. Throughout the entire mixing process, the sides of the mixing bowl should be scraped down occasionally so as to ensure uniformity throughout the entire batter.

PRINCIPLES OF THE CREAMING METHOD

In mixing the sugar and shorteningintimately together during creaming, tiny bubbles of air are whipped into the mass. This air becomes evenly distributed throughout the mixture which gradually becomes lighter and fluffier, increases in volume and assumes a spongy structure sometimes termed "creamed".

When the eggs are mixed into the creamed mass this "cream" gradually becomes an emulsion which is an intimate mixture of very fine particles of moisture surrounded or suspended in a film of fat. Up to a certain point, the addition of liquid, either of the eggs or the milk, will not breakdown this "water" in fat emulsion. Beyond a certain point, however, the liquid will over-balance the fat in the emulsion and break it down.

This means that the tiny water particles which were locked in tiny fat particles break their way through. In such a state, we have fat particles dispersed throughout the water or, in other words, the cream-like fat in the emulsion which is much thinner in consistency. This condition, known as curdling, must be prevented if light cakes are to be obtained.

In order to secure a "cream" and batter of the best character for cake mixing, its temperature should be kept in the range of 72° to 78°F. If the fat is extremely cold and too hard, it will not take up as much air or cream as nicely as when a little warmer. However, if the fat is sufficiently plastic to permit proper creaming, the cooler the batter the greater leavening effect of the creaming process.

On the other hand, if too warm, the fat will lose its plastic consistency, becoming oily so that the sugar, shortening mixture will lack body or the ability to stand up well in the creaming process.

If the sugar and shortening have a temperature of not over 78°F before creaming, satisfactory results will usually be obtained provided the room temperature is not much above 75°F. The friction created in the creaming process may raise the temperature of the cream two or three degrees, but as the cooler eggs and milk are added, the temperature of the batter will probably be brought close to 72°F. The flour containing the baking powder which is incorporated toward the end of the mixing, imparts body to the batter and in connection with the eggs, enables the batter to stand up well during its rising in the oven, giving the desired structure to the finished cake.

TWO STAGE METHOD

In this method of mixing, there is no creaming of shortening and sugar. Rather, the shortening and liquid are added to the dry ingredients and this mixture beaten. The eggs are added last and this mixture beaten. The amounts, the order in which the ingredients are added, the speed, and the time which they are mixed contribute to the stability in the batter that will continue through the finished cake. It is, therefore, suggested that the mixing times of the formulas be followed exactly. Cake mixed by this method usually requires more leavening agents due to the fact that loss of air is creamed into the mixture and the fact that less air is added to the batter early in the mixing rather than at the end as in the creaming method of mixing. This method of mixing is not recommended for handmixing due to the difficulty of the blending of all dry ingredients at one time.

MIXING METHOD (FOAM CAKE)

The foam-type cake family includes white angel food cakes made with egg whites and yellow sponge cakes made with whole eggs. A true sponge or foam-type cake contains no shortening and no leavening excep t the air beaten into it during the mixing.

Cakes of the foam or sponge type are mixed and handled somewhat differently from the heaviertypes of cake made by the batter method. Since foam or sponge type cakes owe their lightness to the air which is beaten into the eggs, particularly the egg whites, during the mixing process, the secret of good foam or sponge cakes lies primarily in proper beating of the egg and careful handling of the batter to prevent escape of the incorporated air.

Ordinarily, the eggs are first beaten together with a portion of the sugar and salt, forming a light, foam-like structure due to the air which is whipped into the eggs during the beating process. Equal amounts of sugar and eggs seem to produce the ideal beating mix. If liquid such as milk or water is called for in the formula, it is usually added after the eggs have been whipped. Eggs, sugar, and liquid should be at a temperature of 100°F to 120°F., to obtain maximum lightness; it is difficult to make good foam or sponge cake with cold ingredients.

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After the eggs are beaten, the gentlest possible handling is necessary. The flour and baking powder (if used) are sifted and blended thoroughly and are then gently folded into the whipped mixture. Vigorous beating or over-manipulation after the flour is added, tends to break down the cells and force out the air. The trick is to add the flour so that it is incorporated but the cells which hold the air remain intact. This is not difficult if folding motion is used, preferably with a whip or the hands.

PANNING CAKE BATTER

Cream-type cake batter should be placed in pans that are greased and lined with paper. The amount of batter to use depends on the size of the pan used. Usually the pan must be half filled. For the standard sheet pan 18" x 25" requires six to seven pounds of batter.

The cake batter should be spread evenly in the pan making sure that it covers the four corners of the pan.

It is highly essential to scale and deposit cake batters into pans as quickly as possible after mixing and to ger the pans into the oven in short order so as to prevent the loss of the effective leavening or rising power of the batter.

BAKING

It is practically impossible to lay down a rule concerning baking times and temperatures which will apply universally; however, for each type of cake there is a certain definite baking temperature and baking period that will produce best results. In general, baking temperatures for cakes range from 300° to 400°F. and the baking period from 15 minutes to over 3 hours, depending on the composition, size and shape of the cake. Naturally, the higher the temperature, the shorter the baking period. However, baking temperatures and times are not interchangeable. Experience has taught that for each different type cake there is a certain definite baking temperature and time which must be adhered to if satisfactory results are to be secured. Excess oven heat produces too thick and too hard a crust, and may cause a wild break or burst in the crust due to too rapid expansion of gas within the cake, together with too rapid a crust-forming action. This also results in an impairment of the grain, texture, and eating qualities of the finished cake.

Too low a baking temperature means an unduly long baking period and often results in the cake drying out too much. This means poor eating, keeping qualities, coarse grain, and sometimes too thick a crust.

Cream-type layer and sheet cake being relatively thin will bake through more quickly than loan or slab cake. The larger the cake the longer the baking period. Layer and sheet cakes should be baked at a temperature range of 360°F for approximately 20 to 35 minutes.

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ICINGS

Most pastry products are covered with a sugar coating which we call icings. The icings used have a very definite influence on the success of the product. While it is true that high quality icings properly selected and applied, in itself will not entirely compensate for poor quality in the product it covers. It is equally certain that a product of good quality may be ruined by the use of an inferior icing.

FUNCTIONS OF ICINGS

1. Appearance: A good looking icing properly applied adds to the attractiveness and volume of the product and definitely makes it more desirable.

2. Taste: Icing has a definite bearing on the taste and the easting quality of pastries. Icing improves the eating qualities of a good pastry and in a measure tend to compensate for any deficiency in the flavor of pastry on which they are used.

3. Permits Variety: The use of different types of icings afford a simple means of creating a variety in pastry products.

4. Protects and preserves: A good quality icing represents a protective coating which safeguards the pastry and helps to prevent it from rapid staling.

TYPES OF ICING

In order to study briefly and systematically the types of icings, an attempt has been made to classify them intogroups as follows:

1. Uncooked Icings:
    - a. Water Icing
    - b. Butter Cream Icing
2. Cooked/Boiled Icings:
    - a. Fudge Icing
    - b. Marshmallow Icing

Both types of icing are widely used in bakeries though in service messhalls the uncooked type of icing is the most used. The reason for this is the fact that they are easier and quicker to prepare. Uncooked icing requires the use of powdered sugar while cooked icings can be made with any sugar.

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APPLICATION OF ICINGS

The amount and type of icing to use on a product depends on the judgment of the baker and the desire of the consumers. Kepp in mind that the use of and excessive amount of heavy, sweet icing may stifle rather than please; whereas, a light fluffy icing may be used in larger quantities. In the service mess-halls, water icing is most generally used on sweet dough products and cookies and is applied liberally with the hand or spread with a brush.

Butter cream icings are most generally used on cakes, especially sheet cakes. It is spread on the cake with a spatula. The icing should cover the outside of the cake. The amount of icing to be used on an 18" x 25" sheet cake is 2-1/2 to 3 lbs. per sheet.

Fudge icings should cover the product entirely but should not be too thick due to its very sweet taste. They are poured or spread on with a spatula over the product. These icings are usually applied while they are warm.

Marshmallow icing, being light and fluffy, is ideal for use on light sponge andangel food cakes. It should be spread evenly over the product and then it is usually swirled up with a spatula to give an attractive appearance to the cake.

The time to apply icings varies according to the product, but the general rule is that sweet dough products may be iced any time after they are baked. Cakes should always be thoroughly cooled and brushed free from all crumbs before icing.

STORAGE OF ICING

Most icings have very good keeping qualities and if handled properly may be made well in advance.

Water icing, being made of sugar and water, will keep indefinitely as long as it is kept free from dirt.

Butter cream icing contains butter and usually milk. It will keep for long periods of time, but it must be kept refrigerated to prevent it from becoming rancid and spoiling.

Fudge and fondant icings have excellent keeping qualities if refrigerated. When ready to use again merely warm to 100°F. over a hot water bath while stirring.

Marshmallow icing does not have very good keeping qualities and should never be made in any large amounts too far in advance. Because of the large egg white content, marshmallow icing will become dry and tend to shrink excessively; even refrigeration will not prevent this from occuring.

COOKIES

Cookies are always popular and should be very satisfactory as summer desserts in the mess. Unlike most other desserts, cookies will keep almost indefinitely and can be baked ahead of time and used as needed.

TYPES OF COOKIES

Cookies fall into two general types. They are as follows:

1. Hard/Brittle Cookies
2. Soft/Chewy Cookies

The proportion of sugar in respect to the flour determines whether the cookie will be hard or soft type cookies.

Hard/Brittle Cookies

a. Contain an equal or greater amount of sugar than flour.
b. Contain little or no liquid.
c. Usually consists of a very stiff dough.

Soft/Chewy Cookies

a. Contain equal or greater amount of flour than sugar.
b. Contain sufficient liquid to dissolve sugar in the mix.
c. Is usually a drop matter.

Soft batter cookies may be dropped by hand or teaspoon in pieces the size of a walnut on a greased and flour-dusted pan.

Stiff batter cookies may be rolled out in large strips and cut into pieces of about the same size. These pieces are placed on the pan and flattened before baking.

INGREDIENTS

1. Flour: Flour is the chief structure builder in all cookies. In cookie production, some cookie mixes will call for hard flour while others may call for soft or a blend of the two. If available, the flour called for in the formulashould be used.

2. Sugar: The type and amount of sugar used in a cookie mix controls to a large extent the spread of the finished cookies. Regular granulated produces the greatest spread. Any sugar crystals remaining undissolved in a cookie dough will melt during baking and tend to spread the cookie over a larger area. Powdered sugar, soft sugar crystals or sugar in solution (syrup) tend to limit the spread or flow. As the sugar is increased, the cookie will spread more and be more brittle. Brown sugar may be substituted for part of the granulated sugar in the recipe.

3. Shortening: This ingredient contributes, especially in combination with sugar and other ingredients, to the spread in some types of cookies. The chief function of shortening in cookie mix is to promote tenderness. Any solid fat with the exception of theemulsifier type may be used.

4. Liquids: Liquids going into a cookie mix are a partial control of batter consistency. Liquids also make functions of the other ingredients possible. In many instances additional water added to a cookie mix will result in a tougher product with less spread. The additional water will cause more development of the flour and cause the sugar to go into solution quicker.

5. Leavening: The type of leavening used in a cookie mix is a partial control of the spread or size of a cookie. The extent of this action depends upon the amount of unneutralized soda in the mix. Excessive baking soda will produce a cookie with too much spread, a darker crust color and an undesirable soapy flavor. In some instances, baking powder can be used to produce spread. However, as implied by the combinationof food acid and baking soda it is used primarily to produce the desired spread along with the lightness without distracting from or changing the finished flavor. Soda leavened cookies will have greater spread and darker color. Baking powder is the opposite.

6. Eggs: Eggs are not a necessary ingredient in all cookie mixes. Eggs are used chiefly for structure and are only used in substantial amounts in certain soft type cookies. Brittle type cookies will contain little or no eggs.

When molasses or syrups are used, it will be necessary to omit an equal amount of the sugar from the formula. The character of the finished cookie dep-nds on proper mixing of the ingredients.

OVERMIXING

Products atight dough or batter which will not "spread" properly during baking. The cookies tend to become tough, have a tight grain and close texture.

UNDERMIXING

Produces a coarse dough or batter which may cause cookies to spread excessively during baking. This may result in producing cookies with distorted shapes, too large in diameter, no volume, coarse grain, and harsh texture. The spread or latoral expansion of the cookie in the pan should be carefully controlled in order to produce a finished cookie of excellent shape and texture. The amount of sugar in the dough has effect on the spread. Increased sugar causes greater spread in the cookie during baking. By varying the sugar, it is possible to adjust the spread. Spread is also influenced by the amount of moisture in the cookie dough.

Slack doughs spread more during baking than do stiff doughs. Variations in moisture, therefore, should be used to control the spread of the finished cookies. Soda also affects spread of the cookie during baking. More soda produces a greater spread. Exact specifications for soda given in the formula should be followed.

Most cookies are baked attemperatures between 375°F and 400°F.

Cookies should be baked at constant heat. Flash heat should be avoided. Double panning is often essential in ovens where bottom heat is excessive and cannot be easily controlled.

COOKIE FAULTS AND REMEDIES

Cookie stick to the pan. Cookies will stick if pans are not greased sufficiently. If pans are not properly cleaned the cookies may stick. When excessive carmelizing materials such as milk, solids, (milk solids) and sugars are used, the cookies brown (carmelize at a low temperature causing them to stick.) Excessive heat in bottom of oven causes the cookies to burn on the bottom, with the result that the cookies will stick.

Cookies spread excessively when the formula contains a high percentage of sugar and the cookies are baked at a high temperature. Cookies of this type usually contain very little moisture and most of the sugar is in the crystalline state (has not been dissolved) in the cookies. When heated in the oven the sugar melts, thus giving a spreading action.

Too much baking soda will cause excessive spreading. Greasing the pans too heavily also will cause excessive spreading. This will result in thin edges on the cookies. Insufficient mixing will cause excessive spread.

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PIE DOUGH (YIELD - 20 POUNDS)

Flour (hard wheat)	6 lbs.
Flour (pastry)	4 lbs.
Salt	4-1/2 oz.
DSM	4 oz.
Shortening	7 lbs. 8 oz.
Water (ice cold)	2 lbs 8 oz.

Method: Sift dry ingredients into dishpan; add shortening and rub by hand until the lumps of shortening are the size of marbles. Add the cold water at one time. Mix only until a dough is formed. Scale into the desired size pieces; chill. The pie dough is then ready for make-up. All pie dough should be rolled out 1/8th inch thick. NOTE: The size of the flake can be controlled by the size that the shortening is rubbed to. The smaller the lumps the less flake.

BUTTER COOKIES

Sugar (powdered)	3 lbs.	Cream on 2nd speed, 10 minutes.
Shortening (Type III)	3 lbs.	
Salt	1/2 oz.	
Vanilla	1 oz.	
Eggs	10 oz.	Add slowly, cream 6 min., 2nd
Water	10 oz.	Add on 1st speed; mix only until smooth.
Flour (hard wheat)	4 lbs. 12 oz.	Sift together; add slowly on 1st speed; mix only until smooth
Baking powder	1/2 oz.	
DSM	2 oz.	

Bag out on dobed pans. Bake at 400°F. Top heat high, bottom heat low.

JELLY ROLL (COLD ROLL)

Eggs	5 lbs.	Heat in water bath to 100°F. Whip on 3rd speed until mixture holds a crease.
Sugar	5 lbs.	
Vanilla	1 oz.	
Flour (cake)	3 lbs. 8 oz.	Sift together; fold into the above by hand. Use care not to knock air out of mixture.
Baking powder	2 oz.	
Salt	1 oz.	
Water (hot)	1 lb. 8 oz.	Add slowly and stir in.

Scale 3 pounds into well dobed pan. Bake at 400°F. This product may be rolled while hot or when cold.

BROWNIES (YIELD - 1 SHEET PAN)

Sugar	3 lbs. 8 oz.	Mix on 1st speed, 5 min.
Shortening	1 lb. 11 oz.	
Cocoa	11 oz.	
Salt	1 oz.	
Flour (pastry)	2 lbs.	
Corn syrup	1 lb.	
Eggs	1 lb.	Add slowly and mix 3 min., 1st speed.
Vanilla	1 oz.	
Water	8 oz.	
Nuts (pecan pieces)	1 lb. 8 oz.	Add and stir in.

Place in well dobed sheet pan. Bake at 325°F.

FUDGE ICING

Sugar (powdered)	10 lbs.	Place on mixing machine.
Vanilla	1 oz.	
Salt	1/2 oz.	
Cocoa	1 lb.	
Water	2 lbs.	Boil; add to the above at one time. Mix smooth.
Butter	1 lb.	
Corn syrup	12 oz.	

SWEET ROLL ICING

Water (hot)	1 lb. 12 oz.	Place in mixing bowl; use paddle.
Corn syrup	12 oz.	
Salt	1/2 oz.	
Sugar (powdered)	12 lbs.	Add to the above while mixing on 1st speed.
Butter or Shortening	8 oz.	
Vanilla	1 oz.	

MELTAWAY CREAM FILLING FOR SWEET ROLLS

Sugar (powdered)	10 lbs.	Cream on 2nd speed well, approximately 10 min.
Shortening	5 lbs.	
Dry skim milk	2 oz.	
Egg whites	1 lb.	Add slowly and cream well.
Lemon juice	2 oz.	

CINNAMON SUGAR

Sugar	10 lbs.	Place on machine; use paddle. Mix until smooth and moist.
Cinnamon	8 oz.	
Cocoa	2 oz.	
Shortening	4 oz.	

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PECAN PIE

Sugar	2 lbs.	Bring to boil.
Butter	3 oz.	
Shortening	3 oz.	
Corn syrup	1 lb. 8 oz.	

Whole eggs	1 lb. 8 oz.	Beat eggs well; then add nuts; pour the hot syrup over the egg mixture. Stir well. Deposit in pie shells. Bake at 375°F.
Pecans	1 lb.	

PEANUTBUTTER COOKIES

Sugar (brown)	1 lb. 8 oz.	Cream together, 6 min., 2nd.
Sugar (granulated)	1 lb. 8 oz.	
Shortening	1 lb. 4 oz.	
Salt	1 oz.	
Baking soda	3/4 oz.	
Eggs	8 oz.	
Vanilla	1/2 oz.	

Peanuts, roasted (chopped fine)	1 lb.	Add to the above and mix smooth.
Peanut butter	1 lb. 4 oz.	
DSM	1 oz.	
Water	4 oz.	
Flour (pastry)	2 lb. 2 oz.	

Cut into 1 oz. pieces. Place in pan 4 x 6. Flatten with a fork that has been dipped in sugar. Bake at 380°F.

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MODIFICATIONS

Pages 44-79 of this publication has (have) been deleted in adapting this material for inclusion in the "Trial Implementation of a Model System to Provide Military Curriculum Materials for Use in Vocational and Technical Education." Deleted material involves extensive use of military forms, procedures, systems, etc. and was not considered appropriate for use in vocational and technical education.

FOOD SERVICE SCHOOLS

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GLOSSARY OF FOOD SERVICE TERMS

For Instructional Purposes Only

MARINE CORPS SERVICE SUPPORT SCHOOLS
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

GLOSSARY OF FOOD SERVICE TERMS

This glossary is primarily a collection of the more commonly used food service terms and their definitions. Cooks and other mess personnel should find it useful. However, certain technical, biological, and chemical terms have also been included. These unusual terms will be useful to the students in the more advanced food service courses, such as nutrition, mess management, and commissary operations. Although students are trained in specific fields in subsistence, it is necessary for them to understand and become familiar with food service terms outside their own specialty. The glossary is not a comprehensive list of every food service term, but it does include the terms most often used by food service personnel. The first section of the glossary includes terms in English. The second section covers the most common terms found on a menu in French, together with a phonetic pronunciation and a very short definition.

SECTION I

FOOD SERVICE TERMS

Absorption. Taking in by molecular action. In baking, the property of flour to absorb and hold liquid. In nutrition, the assimilation of fluid or other substances by the skin or by absorbent vessels.

Absorption Test. Test to determine percentage of water to use per 100 pounds of flour when baking bread.

Acetic Fermentation. During baking, a chemical change in which acetic bacteria in flour convert diluted alcohol into vinegar.

Acid. A compound containing replaceable hydrogen. When an acid is placed in solution with a positive (metallic) element, the reaction produces a salt.

Acid Water. Water containing sulfur compounds. When blue litmus paper is placed in it, the paper turns red. Acid water hastens fermentation and makes dough age quickly. It may be filtered through limestone.

Acidity. Sourness; tartness; a condition indicating excess fermentation in yeast doughs.

Acidosis. Any condition in which the body's alkaline reserve is depleted. It may result from abnormal loss of alkaline salts or from abnormal accumulation of acid salts.

Active Dry Yeast. A commercial type of dehydrated yeast. It is used for oversea shipment because it can be stored for months without refrigeration. It has more leavening power than compressed yeast.

Adipose. Fatty tissue.

Adrenal Glands. A pair of endocrine glands, one situated above each kidney.

Adrenaline. A hormone secreted by the adrenal glands.

Aeration. Treating dough or batter by charging with air or carbon dioxide gas to produce volume increase.

Aerobic. Living or active only in the presence of oxygen.

Afferent. Bringing to, or leading toward, a central organ or point.

Aitch Bone. A bone in the rump shaped somewhat like the capital letter H.

Air Shutter. A swinging disk in the mixing chamber of a gas burner which regulates the amount of air to be mixed with gas.

Albumen. Egg white.

Albumin. A protein found in nearly all animal and some vegetable tissues. Albumin is soluble in water and can be coagulated by heat. It contains carbon, hydrogen, nitrogen, oxygen, and sulfur.

Alcohol Fermentation. Chemical change in which yeast converts sugar into equal parts of carbon dioxide gas and alcohol.

Alkali. A substance that, in solution with water, is caustic; such as household lye.

Alkaline Reserve. The quantity of alkali in the body that may be used to neutralize acid.

Alkaline Water. Water containing small amounts of alkaline minerals like sodium carbonate. When red litmus paper is placed in it, the paper turns blue. Alkaline water can slow dough fermentation, but the addition of vinegar can counteract this effect.

Allergy. Exaggerated susceptibility to a substance which in similar amounts is harmless to most persons.

Almond Paste. Almonds ground to paste, with sugar added. The paste is used in coffeecake fillings or as a base for almond macaroons.

Amino Acids. Organic acids containing nitrogen, sulfur, and sometimes phosphorus and iron, that are compounded to form proteins.

Amoebic Dysentery. A disease caused by infection of the intestine with a type of single-cell organism present in food or in water.

Amylase. Any one of a series of enzymes which convert starch into sugar.

Amylopsin. An enzyme of the pancreatic juice capable of converting starch into sugar.

Anabolism. The process in a plant or animal by which food is changed into living tissue.

Anaerobic. Living or active only in the absence of oxygen.

Anemia. A condition of the blood in which there is either a deficiency in the number of red blood cells or in the amount of hemoglobin within the red blood cells.

Anise Oil. Flavoring made from aniseed, a seed from a plant of the celery family.

Antitoxin. A substance which will neutralize poisonous materials such as toxins.

Appetite. The desire to eat, as distinguished from hunger or the compelling necessity to eat.

Apricot Glace. Jamlike product of boiled apricots and sugar.

Ascorbic Acid. Vitamin C. Prevents scurvy.

Aspic. A savory clear meat jelly used to garnish meat or fish; a mold made with meat, fish, or vegetables.

As Purchased (AP). A term used to denote fresh food purchased as harvested, including the inedible portions.

Atlas. The first vertebra in the neck.

Bacillary Dysentery. A disease caused by bacteria transmitted to food by flies, insects, vermin, or improper practices by carriers.

Bacillus. A rod-shaped form of bacterium.

Backstrap. The spinal cord.

Bactericidal. Destructive to bacteria.

Bacteriostatic. Preventing bacterial growth without killing the bacteria.

Bain-marie. A table with an open top and a pan for hot water to hold food containers of various sizes and keep the foods hot until they are served.

Bake. To cook by dry heat in a closed place, usually in an oven. Griddle cakes may be baked on hot metal. When applied to meats, baking is synonymous with roasting.

Baker's Scraper. A thin piece of steel 7 inches long with a cleat handle across the full length of one side, used by bakers and meatcutters to keep worktables clean or to cut dough by hand.

Baking Loss. The loss of dough weight (usually 10 or 12 percent) after the fermentation period. The baking loss takes place during the processes of makeup, proofing, baking, and cooling.

Baking Powder. Chemical leavening agent composed of soda, edible acids, and, usually, cornstarch to absorb air moisture. When wet, this agent forms carbon dioxide gas to cause the batter to rise.

Baking Soda or Sodium Bicarbonate. Sodium salt of carbonic acid having the ability to combine with acid to produce carbon dioxide gas. It is alkaline in nature.

Barbecue. To roast or cook slowly, basting with a highly seasoned sauce.

Barrel Mixer. Mixer capable of mixing at one time 200 pounds of flour plus all other necessary ingredients to form a dough. Mixers come in various sizes.

Base. A substance which combines with acids to form salts.

Baste. To moisten with liquid, seasoning, or melted fat during cooking to prevent drying of surface and to add flavor.

Batter. Mixture of combined ingredients such as flour, sugar, eggs, shortening, and milk, thin enough to be poured or dropped.

Beat. To use a fast, rotary, over and under movement to incorporate air into a product.

Beater. An instrument or device for beating. In the garrison mess, an accessory used with a vertical mixing machine to mash potatoes and other foods.

Beam Scale. A device to measure weight which utilizes a beam from which the weights and the ingredients are suspended.

Beef. The flesh of cattle over 1 year in age.

Bile. Fluid secreted by the liver and delivered to the intestine.

Biotin. A minor water-soluble vitamin linked with carbohydrate metabolism.

Bladebone. A bone in the forequarter in beef somewhat like the shoulder blade in humans.

Blade Tension Control. A device which raises or lowers the upper wheel of a bandsaw, thereby increasing or decreasing the tension of the blade.

Blanch. To cook in hot, deep fat for a short time until partially cooked but not brown; to dip in boiling water for a few minutes for the purpose of removing the skins from vegetables, fruits, and nuts.

Bleeding. Term applied to dough that has been cut and left unsealed at the cut, thus permitting the escape of air and gas.

Blend. To mix thoroughly two or more ingredients so that they lose their original properties and become an entirely new mixture. In baking, a mix of two or more flavorings or grades of flour or the process of mixing two or more ingredients such as flour and shortening in the first step of making pie dough.

Blended Shortening. Shortening made by blending edible oils and fats in proportions that result in a plastic consistency comparable to that of lard.

Blocking the Hindquarter. Cutting the hindquarters into large cuts.

Boil. To cook in a liquid in which bubbles rise and break at the surface.

Boiled Icing. A frosting made by boiling sugar and water to thread stage and adding the mixture to beaten egg whites.

Boiling Point. The temperature at which a liquid vaporizes; the point at which the vapor pressure is equal to the atmospheric pressure.

Balogna. A large sausage, made of beef, veal, and pork, enclosed in a casing, smoked, and cooked.

Bolting. Sifting of ground grain to remove the bran.

Boneless Inside Chuck. A cut of boneless beef taken from meat lying along the ribs and backbone from a point between the third and fourth ribs to a point between the seventh and eighth ribs. The boneless chuck is used for roasts and steaks (dry heat cooking).

Boneless Neck. A cut of boneless beef taken from meat lying along the ribs and backbone from a point between the third and fourth ribs to a point near the second vertebra of the neck. Boneless neck may be used as roast and steak (moist heat cooking) as well as for stew meat and ground meat.

Boneless Rib. A cut of boneless beef taken from meat lying along the ribs and backbone from a point between the seventh and eighth ribs to a point just beyond the twelfth rib. Bonelsss rib may be used for roasts and steaks (dry heat cooking).

Boning Knife. A knife 6 inches long, especially designed for cutting through joints and close around bones.

Bottom Round. A cut of beef taken from the outer portion of the round at the round (leg)bone, used for braising, stewing, or grinding, and sometimes for broiling and grilling.

Bouillon. Soup stock clarified by straining.

Bowl Knife. Spatula or flexible dull-edged knife used to ice cakes.

Braise. To brown in fat and then cook slowly in a small amount of liquid in a covered utensil in the oven or on top of the stove.

Bran. Skin or outer covering of the wheat berry.

Bread. To cover with crumbs or other suitable dry coating material, usually after dipping the food in an egg-milk mixture.

Break and Shred. The condition of the area around a loaf between the panned body of the loaf and its top crust. An even break with evenly shredded appearance is ideal.

Brisket. In domestic animals, the breast or lower part of the chest, used for braising or roasting.

Broil. To cook under or over direct heat; to cook by direct exposure to radiant heat, as on a gridiron over live coals; to grill.

Broilers-fryers. Young chickens from 3/4 to 3 1/2 pounds with soft, pliable breastbones.

Broth. Stock resulting from one type of meat or fish simmered in water; as, clam broth or beef broth.

Brown. To produce a brown color on the surface of food by subjecting it to heat.

B.t.u. British thermal unit; the amount of heat needed to raise the temperature of 1 pound of water 1° Fahrenheit.

Buffer. A substance that tends to prevent or minimize a change in the acid base reaction of a solution.

Buffet Service. A labor saving and profitable method of serving wherein guests serve themselves from a large table instead of being served by waitresses at individual tables. This method of serving is sometimes used in open messes.

Burning In. Heating tinplated pans in a moderate oven for 6 to 8 hours or until a bluish tinged tin-oxide coating is produced.

Bussing. Clearing tables by collecting individual mess trays, chinaware, paper, and silverware and resetting tables.

Butcher's Saw. A saw with a frame and a narrow, removable blade for cutting bones.

Butt. In produce operations, the end of a vegetable nearest the roots, away from the head or top; the thick end of anything. In meat market operations, the thick end of a ham.

Butter. The fat of milk separated from milk and cream by churning. According to Federal specifications, butter must be not less than 80 percent milk fat.

Butter Fat. Natural fat of cow's milk.

Butterscotch. Flavor produced by cooking a mixture of butter and brown sugar.

Butter Sponge. Sponge cake-type batter to which butter is added. Used for torten, French pastry, and some layer cakes.

Buttons. The small extensions of the bones of the backbone.

Butyric Acid. An organic acid found in rancid butter and fats. It has the characteristic odor and flavor of rancidity.

Butyric Fermentation. A chemical change in which butyric acid bacteria break down the fats in a dough and impart an unpleasant taste of rancid butter to bread. It occurs at about 104° F.

Calciferol. A complex fatty-type alcohol which becomes vitamin D_2 when irradiated. A kind of antirachitic vitamin produced by irradiation of ergosterol.

Calcification. The process by which tissue becomes hardened by deposits of calcium salts within its substance.

Calcium Propionate. A chemical used as a rope and mold inhibitor in bread.

Calorie. A unit of energy. A large calorie is the amount of heat needed to raise the temperature of 1 kilogram of water 1° C. A small calorie is the amount of heat required to raise 1 gram of water 1° C. The small calorie is the unit of measurement for the energy (heat-producing) value of food.

Calorimeter. An instrument used to measure quantities of heat.

Candy. To cook in sugar or sirup.

Caramelize. To heat sugar or foods containing sugar until the sugar melts and a brown color and characteristic flavor develops. The sugar or other food must be stirred constantly to prevent scorching. Caramelized sugar is used for flavoring and coloring.

Carbohydrates. Sugars and starches derived chiefly from vegetable sources which contain set amounts of carbon, hydrogen, and oxygen, according to the kind of carbohydrates. Carbohydrates produce quick energy and body heat.

Carbon Dioxide. Compound containing 2 parts carbon and 1 part oxygen. It is the gas that we exhale during breathing. In baking, the colorless, tasteless, and edible gas produced during fermentation or from the combination of soda and acid.

Carborundum Oilstone. An abrasive stone used with oil to sharpen knives.

Carcass. The dressed body (trunk) of an animal slaughtered for food.

Cardio-Vascular System. The heart and blood vessels.

Carotene. Yellow pigment found in various foods. Known to be the precursor of vitamin A, it is often called "provitamin A."

Cartilage. Translucent, elastic tissue which composes most of the skeleton in embryos and in the very young, becoming mostly converted into bone later; the elastic tissue at the end of the ribs which has not been converted into bone.

Casein. The principal protein in milk, produced when the milk is coagulated by acid; the curd of sour milk.

Casing. A cleaned intestine of cattle, hogs, or sheep, used as a container for sausage; an artificial tube made of plastic material, used as a container for sausage.

Catabolism. The process in a plant or animal by which living tissue is changed into waste products of a simpler chemical composition.

Catalyst. A material used to accelerate a chemical reaction, such as when nickel is used to force hydrogen gas to unite with shortening in the hydrogenation process. Catalysts are recovered and do not become a part of the finished product.

Catalyst. A substance which alters the rate of a chemical change, but itself remains unchanged during the reaction.

Cavity. The hollow space in the body after fowl has been drawn.

Cell. One of the small units which make up living tissues.

Cellophane. An elastic tissue made from viscose and usually having two coated moistureproof sides.

Cellulose. A complex carbohydrate which makes up the rigid or woody structure of plants and trees. Cellulose provides roughage for the digestive system.

Centerpiece. An ornament, bowl of flowers, or other decoration for the center of the table.

Centigrade. A thermometer scale on which 0° is the freezing point, and 100° the boiling point, of water.

Cheesecake. Cake usually made of a sweet or short dough base with a filling of combined cheese, eggs, and milk.

Chef. Chief cook.

Chill. To place in a refrigerator or cool place until cold.

China Cap. A cone-shaped strainer with a cone-shaped wooden plunger, used mainly to puree foods.

Chine bone. The bone in the backbone just above the pelvis bone.

Chloresterol. A complex, highly stable, neutral, crystalline alcohol, a component of many lipids (fats) in animal and plant tissue.

Chloride. A compound of chlorine and another element; a chemical such as sodium chloride (table salt) which slows yeast action and strengthens gluten.

Chlorophyll. The green coloring matter in plants. It permits plants in the presence of sunshine to take carbon dioxide from the atmosphere; the carbon dioxide then combines with water from the ground to form carbohydrates.

Cholesterol. A sterol of animal origin found in bile, blood, and brain.

Choline. A water-soluble vitamin which is a constituent of lecithin, an essential body fat.

Chop. A small cut or slice of meat often including a rib; as, a lamb or pork chop. To cut food into small pieces with a sharp knife or chopper.

Chuck. The portion of the forequarter of beef including the first seven ribs, the parts about the shoulder blade, and most of the neck.

Chuck tender. A boneless tapering cut of beef in the forequarter attached to the bladebone, used for braising, stewing, and grinding.

Chyme. Partly digested materiel which the stomach passes into the intestine.

Citric Acid. An organic acid found in citrus fruits.

Clear Flour. The part left after patent flour and low-grade flour are separated from the milled wheat. Clear flour has a large amount of low-quality protein and can be mixed with rye flour or whole wheat flour to make rye bread or whole wheat bread.

Clod. The part of the neck of beef nearest the shoulder.

Coat. To cover the outer surface of a food with a suitable coating material such as flour or crumbs.

Coccus. A round-shaped form of bacterium.

Cocktail. An appetizer of raw oysters, clams, or shrimp, served with a sauce of catsup, lime juice, and a peppery seasoning; an appetizer of chilled cut fruits, tomato juice, and so on; an iced drink of spiritous liquor well mixed with flavoring ingredients.

Cocktail Sauce. A sauce served with shrimp cocktail, usually made of catsup or chili sauce, lemon or lime juice, and a peppery seasoning.

Cod Fat. Thick layer of fat attached to the loin muscle and the flank.

Coffee Urn. An upright cylindrical container in which coffee is brewed by the drip method; it consists mainly of a boiler, twin liners, a leacher assembly, spray head, and various controls and instruments.

Coleslaw. A salad made with chopped or sliced cabbage, mayonnaise, vinegar, spices, and sometimes cream.

Color Test. See Pekar Test.

Combustion. Act or process of burning. Any chemical process that produces light and heat. The combination of any substance with oxygen. Rapid oxidation.

Commensals. Organisms that live on a host but not at the expense of the host. Intestinal bacteria are an example of commensals.

Complete Protein. A type of nutrient containing all the known essential amino acids.

Compound. A combination of two or more elements united in definite proportions by weight. The components may be separated only by chemical means.

Compounds. Shortenings made by blending a vegetable oil with a hard fat.

Compound Sugar. A sugar-like sucrose or maltose that must be broken down by enzymes before it can be used as food by yeast.

Compressed yeast. A commercial type of yeast prepared from manufactured yeast cells by progressively cooling, filtering, and compressing large numbers of the cells. It is light cream to light brown, firm, and brittle. It is used most often in garrison bakeries because it is fast acting, uniform, and easily prepared for use in dough.

Condensate Outlet. A small outlet in a coffee urn to drain away moisture which condenses in the airspace between the boiler and the liners.

Condiment. A sauce, relish, or spice, used to season or improve the taste of food; mixtures of spices and other ingredients such as celery seed, mustard, catsup, and chili sauce.

Congealing Point. Temperature at which proteins and starches coagulate.

Conjunctivitis. Inflammation of the membranes which line the eyelids and cover the eyeballs.

Connective Tissues. Tissues which support and connect other body tissues; for example, muscle connected to bone.

Contaminate. To stain, soil or pollute; to make impure.

Continuous Breadmaking System. A system of dough mixing, operated by one man through a control panel, which utilizes a liquid ferment and a method of bringing together continuously in small increments all the ingredients in the right proportions.

Contract. An agreement, especially one legally enforceable, between two or more persons to do or forbear something; a bargain, a covenant. Contracts or agreements between the open mess and contracting vendors are not Government contracts and are enforceable against the open mess, not against the U.S. Government.

Control Valve. A device by which the flow of liquid, air, or gas may be started, stopped, or regulated by a movable part which opens or obstructs passage.

Conveyor Slip Clutch. A device which controls the action of the conveyor chains in a dual-tank dishwashing machine by disengaging the chains from the chain-drive assembly.

Conveyor Toaster. An electric or gas heated toaster consisting of a number of toasting baskets mounted on an endless conveyor chain, which is driven by an electric motor.

Cooling Bread. Allowing baked bread to drop in temperature from 212° Fahrenheit to about 90° Fahrenheit, when it can be sliced and wrapped.

Cornet. A cornucopia-shaped (horn-shaped) container of paper or cloth used for tubing soft dough or frosting.

Corn Flour. Coarse flour ground from corn. Corn flour is finer than meal.

Cornmeal. Granular form of corn somewhat coarser than corn flour.

Cracklings. The crisp residue of fat, especially hog's fat, after the fat or lard has been removed.

Cream Filling. Cooked mass of sugar, egg, milk, and a thickener, used for pies and fillings.

Creaming. The process of combining sugar and shortening by heating.

Crop. A pouchlike enlargement of the gullet (throat) of many birds, with thick muscular walls in which food is softened for digestion.

Croquette. A food product, or combination of food products, usually breaded and deep fried.

Crosscut Chuck. The portion of the forequarter of beef which is left when the rib and plate are cut off.

Cross-Grain Molding. Curling of dough at left or right angles to its direction of travel from the sheeting rolls; usually produces a loaf with close grain and smooth texture.

Crouton. A small piece of bread, toasted or fried crisp, used in soups or in garnishing.

Crumb. In cooking, a small piece of bread or cake used to cover or coat; in baking, the soft part of bread.

Cube. To cut food into approximately 1/2-inch cubes.

Curd. The coagulated part of milk separated from the whey or watery part.

Custard. Sweetened mixture of egg and milk which is cooked over hot water or baked.

Cut In. To blend cold shortening with flour by means of a pastry blender or two knives.

Cutlery. Edged or cutting instruments, such as knives or razors.

Cutlet. A small piece of veal, cut from the leg, ribs, or shoulder, for broiling or frying; a croquette shaped like a cutlet. Leg cutlets make two or three servings; loin cutlets make one.

Cut Straight Flour. Flour left when part of patent flour is removed from straight flour.

Cutting Loss. The difference between the weight of a carcass or wholesale cut and the total weight of the salable cuts, fat, bone, and inedible trimming.

Danish Pastry. Flaky yeast dough having butter or margarine rolled into it.

Date Filling. Cooked blend of ground dates, water, and sugar. Chopped nuts may be added.

Deaminization. The process by which the ammonium group is split from an amino acid molecule. The splitting away of the nitrogen particle from amino acid leaving carbon, hydrogen, and oxygen (CHO).

Decalcomania. A picture or design transferred from specially prepared paper to china, glass, or other substance.

Deckle. A piece of meat cut away when brisket is trimmed for a roast. The deckle is cut into diced meat for stew or used for ground beef.

Deep Fat Frying. Cooking food by immersing in hot fat.

Delmonico Steak. A small rib steak.

Detergent. A soluble cleansing agent, usually synthetic. Like soap, detergents can emulsify oils and hold dirt in suspension.

Detergent Concentration Meter. A device on some dishwashing machines which indicates the strength of the detergent solution of the wash water.

Dextrin. Soluble, gummy substance formed from starch by the action of heat and/or enzymes; a complex sugar, a polysaccharide.

Dextrose. Simple sugar derived from starches, less sweet than cane or beet sugar; a simple sugar found in fruit juices, honey, and flour. It is also known as corn sugar, starch sugar, and grape sugar and is readily fermented by yeast. In nutrition, it is called glucose, a blood sugar, a monosaccharide.

Diastase. Enzyme possessing the power to convert starches into dextrin and maltose; an enzyme which, in bread baking, liquifies starch, converting it into malt sugar.

Dice. To cut food into 1/4-inch cubes.

Digestion. A bodily function that changes the form of food so that it can be absorbed by the body.

Dipping. Removing hardened ice cream with an ice cream scoop for serving individual portions.

Disaccharide. A double sugar.

Disinfectant. An agent that frees from infection by destroying disease germs or other harmful micro-organisms. Chlorine is used in mess operations when rinse water of suitable high temperature is not available.

Disjointing. Cutting fowl into serving pieces by separating the pieces at the joints.

Dissolve. To change from a solid into a liquid. Dissolved particles cannot be seen or filtered.

Dishwashing Compound. One of several types of compounds developed by research and practical tests for mechanical or hand dishwashing. Care should be taken to use the correct compound for the specific type of operation, e.g., Type I compound for mechanical machines with hard water; Type II for mechanical machines with soft water; hand compound for hand washing in hard, soft, or sea water; and neutral synthetic detergent for hand washing in hard, soft, or sea water.

Divider. Machine used to cut dough into a required size.

Divider Oil. Highly refined, tasteless, odorless, and colorless oil used to lubricate machinery parts that come in contact with dough.

Dividing and Scaling. Cutting the dough into loaf-size pieces and weighing them to insure accuracy and uniformity.

Docking Dough. Slashing the top of a loaf not more than one-half inch deep to permit the escape of carbon dioxide gas from the dough in the oven and prevent the bursting of the loaf at the sides. Rye and French breads are often docked.

Doctoring Dough. Correcting an overaged dough by mixing it with new ingredients to produce a dough similar to the original formula.

Dot. To place small pieces of such foods as butter or cheese over surface of a food to be baked or broiled.

Double Boiler. Two saucepans, one on top of the other; the lower one is filled with water which, when boiled, heats the upper and thus cooks food without direct heat.

Dough. A mixture of combined ingredients for bread, rolls, or cookies, stiff enough to be kneaded or rolled. Dough divider, in breadmaking, is equipment which measures and divides fermented dough into loaf-size pieces. Dough formula, in breadmaking, is a recipe containing the ingredients in the exact amounts sufficient to mix a batch of dough for one baking of bread. Dough hook is an accessory of the vertical mixing machine used for mixing dough; dough schedule, prepared by the chief baker, is a list of the various operations in bread baking, showing when these operations must be performed; the schedule must be rigidly followed to accomplish efficient oven use and fuel consumption with a high quality finished product. Dough temperature refers to the temperature of the dough at the time of discharge from the mixer. Dough thermometer is an instrument with a long metal base for determining the temperature of dough.

Dough Conditioners. Vitamins, minerals, and anti-staling agents added to dough. Antioxidants added to shortening are also dough conditioners.

Doughnut Screens. Screens used to lift doughnuts from fats or to keep them under the fat surface during frying.

Doughnut Sticks. Wooden sticks used to turn doughnuts during frying.

Drawing Ice Cream. Removing ice cream from a freezer.

Drawn Butter. Melted butter.

Dredge. To sprinkle or coat with flour, sugar, or meal.

Dress. To prepare and make ready for use; especially, to draw and clean a fowl.

Drip. A method of making coffee in a utensil in which boiling water filters from a top compartment through the coffee into a pot below.

Drop Cookies. Cookies formed by dropping batter onto baking pans.

Dry Heat Cooking. A method of preparing food in which heat is applied to the food but liquid is not added. Dry heat methods are baking, broiling, frying, and roasting.

Dry Nonfat Milk Solids (Dry Skim Milk). The product resulting after fat and water have been removed from milk. It contains about 1.5 percent moisture, 1.5 percent fat, and 97 percent nonfat solids.

Dry Stores. See Nonperishables.

Dry Whole Milk. A powdered or flaked product obtained by removing practically all water from milk, leaving the dry milk solids intact. It contains about 1.5 percent water, 26.5 percent milk fat, and 72 percent milk solids.

Dry-bulb Thermometer. An ordinary thermometer which measures temperature. Dry-bulb and wet-bulb thermometers are used together to measure the temperature and humidity of the fermentation room and the proofbox in a bakery.

Dual-Pricing. The use of two prices, one for resale purposes and the other for issue, for a single item.

Dual-tank Dishwashing Machine. An automatic dishwashing machine consisting mainly of a wash tank and a rinse tank; a wash chamber and a rinse chamber, located above the tanks; two pumps powered by electric motors; and controls and instruments. A dishwashing machine in which the dishes are washed in one chamber, are conveyed on a conveyor chain, and are rinsed in a second chamber.

Dunnage. Loose material used around and under supplies or a cargo to prevent damage.

Duodenum. The first part of the small intestine, attached to the fundus or stomach.

Dusting. Distributing a film of flour to prevent sticking of dough on work table and makeup equipment.

Dusting Flour. Flour, generally hard wheat, used for dusting because of special properties.

Ear. The fruiting spike of a cereal (as, corn, wheat, rye), including the kernels or grains.

Edible Portion (EP). A term used to denote the part of food most commonly eaten; the edible part without the waste, such as white potatoes without the peelings.

Emulsion. A suspension of fine particles or globules of one liquid in another liquid.

End Paper-feed Machine. A bread slicing and wrapping machine which has the rolls for wrapping the paper at the end of the wrapper unit. The machine is driven by electricity.

Endocrine Glands. Ductless glands which secrete substances into the blood or lymph.

Enriched Flour. Flour to which vitamins and minerals lost in milling have been restored.

Enterokinase. An enzyme found in the intestinal juice which activates erepsin and trypsin.

Entrails. Internal parts; bowels; viscera.

Enzyme. A complex organic substance which hastens chemical change; minute substance produced by living organisms which has the power to bring about changes in organic materials, such as fermentation and oxidation. For example, zymase changes simple sugars into carbon dioxide gas and alcohol.

Erepsin. An enzyme found in the intestinal juice that acts on proteins.

Ergosterol. A sterol found abundantly in fungi, such as yeasts and molds, and in small amounts in higher plants. On exposure to ultraviolet light, it is converted into vitamin D_2.

Esophagus. The tube that leads from the pharynx to the stomach; the gullet.

Essential Amino Acids. A group of amino acids which maintain life and promote growth. They cannot be formed by the human body.

Ethyl Alcohol. An organic compound usually produced by the action of yeast on sugar or starch.

Expansion of Dough. Stage of dough production where air has been trapped by the gluten network to expand the dough.

Evaporate. To expel moisture from until dry and/or concentrated. Evaporated skim milk is liquid milk from which cream has been removed and from which 15 to 20 percent of the water has been evaporated. Evaporated whole milk is whole milk from which 15 to 20 percent of the water has been evaporated. Sweetening is not usually added. The product contains about 8 percent milk fat, 20 percent nonfat solids, and 72 percent water.

Eviscerated Fowl. Fowl which has had the viscera or bowels removed.

Eye of Round. A tender cut from the round of beef; a cut from frozen boneless (7-way) beef.

Family Style. The table service in which everyone helps himself from serving dishes at the table.

Fat. An edible shortening which is solid at room temperature.

Fatty Acid. Organic compound of carbon, hydrogen, and oxygen which combines with glycerol to make fat.

Feather Edge. A very thin edge on a knife that is easily broken or bent.

Featherbones. The portions of the ribs which are attached to the backbone.

Fell. The thin, parchment-like covering of the lamb. The fell is left on roasts but removed from rolled cuts.

Ferment. An agent capable of producing fermentation, especially a living organism like yeast.

Fermentation. Chemical changes to sugar by the action of yeast that produces carbon dioxide gas, alcohol, and acids; a chemical change or action with effervescence, as that produced by yeast. Fermentation loss is the loss of weight of the mixed ingredients during fermentation time, usually 1 or 2 percent. Fermentation period is the time between mixing and dividing the dough. Fermentation ratio is the ratio of the fermentation time before punching, to the fermentation time after punching. Fermentation room is the storage space where atmospheric conditions suitable for fermentation may be maintained. Fermentation tolerance is the range of time a dough may stand after the normal fermentation period without injury to the finished product.

Fibrin. Threads of protein in blood which entangle blood cells and result in coagulation.

Field Ration. Food issued in actual articles, not in money, and authorized for troops in the field. The field ration includes type A ration, type B ration, and the emergency rations.

Field Ration A. The basic ration used by the Army for troop feeding, containing all the required components, issued whenever and wherever circumstances permit. The components are predominantly perishable items.

Field Ration Mess. An organized feeding activity to feed persons authorized to be subsisted on the field ration.

Fillet. A boneless, lean piece of meat or fish. To bone and slice (meat or fish).

Fillings. Sweet creams, jams, and other food mixtures spread between baked cake layers, and on jelly roll sponge.

Finfish. True fish, as opposed to shellfish; any of the fish with fins which must be cleaned before cooking, as opposed to shellfish, which are sometimes cooked before the shells are removed.

Fingerbones. The bones which together make up the backbone; the vertebrae.

Finishing Materials. Ingredients used in the bread production process but not in the dough formula, such as dusting flour, pan grease, and divider oil.

Flaked Steaks. Steaks made from cut portions of beef shaped in a container and frozen. They are cut 1/16 inch thick and packed together to form steaks 5/8 to 7/8 inch thick.

Flange. A rib or rim for strength, for guiding, or for attaching one object to another.

Flank. The side of animal between the ribs and the hip.

Flash Heat. Dry heat radiated from the interior of the oven during the no-load period which causes the first loaves to burn on the surface.

Flash Pans. Old pans containing a little water placed in the oven for a few minutes before loading to absorb flash heat.

Flatware. Articles used for the table which are flat, especially, flat silver (knives, forks, and spoons).

Flavor. Aroma; fragrance. In breadmaking, the sensation received when one inhales the aroma of freshly sliced bread. It should be wheaty, sweet, and pleasant. In cooking, an extract, emulsion, or spice used to produce a pleasant taste; the taste of the finished product.

Flour. Finely ground meal made from wheat or rye grain; the basic ingredient in bread. Part of the flour used in bread must be wheat flour. Flour-handling unit is a machine in which flour is sifted to remove foreign matter and loosen up and aerate flour; different types of flour can be blended in the unit. Flour skids are wooden frames, 5 inches high, of sufficient strength and size to hold twenty-five 100-pound sacks of flour.

Flour Mixing Tolerance. The length of time a flour can be mixed after the gluten has been properly developed until the gluten begins to break down.

Fluff. Mass of beaten egg white.

Foam. Mass of beaten egg and sugar, as in sponge cake, before flour is added.

Fold. combine two or more ingredients with a cutting and folding motion; to add ingredients such as whipped cream or beaten egg whites or sugar carefully with a cutting and folding motion to preserve air bubbles. In bread baking, to lap yeast dough over on itself after mixing and after punching.

Folic Acid. A member of the vitamin B complex group. It is water-soluble and a growth and blood factor.

Food Service. The receiving, storing, preparing, and serving of food items. This term also includes washing, sanitizing, and storing of equipment and utensils.

Fore. Term in meat market operations meaning the forequarter or part near the head.

Forequarter. The front part of a half of a carcass (beef, veal, or mutton).

Forward Area Mess. Field kitchen or mobile kitchen truck located in or near combat area.

Fowl. A domestic cock or hen. Fowls are mature hens more than a year old with no minimum or maximum weights; they usually range in size from 2 1/2 to 5 pounds and have hardened breastbone cartilage and toughened meat.

Frankfurter. A beef and pork or all-beef sausage stuffed in sheep casings, linked and smoked.

Freezing Ice Cream. Reducing the temperature of liquid ice cream mix in a special freezer. During the freezing period, the mix is beaten and its consistency changes to a semisolid form. When the ice cream reaches the proper semisolid consistency, the temperature of the freezer is usually from 21° to 25° F.

French Bread. Bread with a lean to semirich mixture with an open grain, dry crumb, and harsh texture. It is more thoroughly baked than pan bread.

French Knife. Long knife with pointed blade used in cutting cakes, doughs, and nuts.

Fricassee. To cook first by browning in a small amount of fat and then by stewing or steaming. A method of cooking that is usually applied to fowl or veal cut into pieces.

Friction Factor. The amount of heat created in dough during the mixing process. The friction factor must be considered when calculating temperature of water to use so that the dough will come out of mixer at proper temperature.

Frizzle. To cook in a small amount of fat until the food is crisp and curled at the edges.

Frosting. Mixture of sugar and other ingredients, such as shortening, egg white, and flavorings, used to finish and decorate cakes.

Fructose. A simple sugar, also known as levulose or fruit sugar, found in molasses, honey, and fruit juices. A small quantity of fructose will prevent the crystallization of any dextrose and cane sugar present with it.

Fry. To cook in hot fat. When a small amount of fat is used, the process is known as sauteeing or pan frying; when the food is partially covered with hot fat, the process is called shallow frying; when the food is completely immersed in the hot fat, the process is called deep fat frying.

Fryers-roasters. Young turkeys (usually under 16 weeks old) and/or chickens of either sex with flexible breastbone cartilage; their ready-to-cook weight usually ranges from 4 to 8 pounds.

Galactose. A simple sugar.

Gamb Cord. A tendon in the shank of the leg.

Garnish. To add an edible accessory for the sake of appearance or flavor.

Garrison Ration. A monetary allowance for subsistence instead of rations issued in kind.

Gas Orifice. In the mixing chamber in front of a gas burner, the nozzle opening through which gas is ejected to the burner.

Gas Regulating Valve. A valve, hand operated, which controls the flow of gas to a burner.

Gastric Juice. The digestive fluid secreted by the glands in the mucous membrane of the stomach.

Gelatin. Animal jelly; glutinous material obtained from animal tissues by boiling, a jelly formed with gelatin.

Gelatinization of Starch. Formation of jellylike substance when moistened starch is cooked.

Geriatrics. The division of medicine concerned with old age and its diseases.

Germ. That part of seed from which the new plant grows.

Giblets. The edible viscera of a fowl (heart, liver, and gizzard).

Gizzard. The second stomach of birds, having thick walls and a horny lining for grinding food.

Glace. Sugar treated to look like ice.

Glaze. A cooked sirup used to put a shiny finish on pastry items.

Gliadin. That part of gluten which gives it elasticity.

Glucose. Simple sugar made by action of acid on starch (corn sirup); also called dextrose.

Gluten. Protein complex formed when water is kneaded with wheat flour. In breadmaking, a tough, elastic substance which forms the structure of bread and gives the dough necessary strength and adhesiveness to retain leavening gas.

Glycerin or Glycerol. A part of fats and oils.

Glycogen. A complex sugar. The form in which carbohydrates are stored in the liver of muscle tissues.

Gourmet. A connoisseur or critical judge in eating or drinking.

Grain. Internal structure of a loaf of bread. Desirable grain consists of evenly spaced, porous cells of uniform size.

Gram. Unit of weight in the metric system. One ounce avoirdupois equals 28.4 grams.

Graphite Grease. A lubricant used for oven conveyor chains operating under high temperature conditions.

Grate. To rub food over a rough surfaced instrument, such as a grater, to break it into small pieces or shreds.

Grater. A plate used with an attachment of the vertical mixing machine to grate cheese or vegetables.

Gravity Feed Slide. An inclined plate or trough down which bread slides to a certain position.

Gravy. A sauce for meat, fish, or vegetables. Gravy is usually made with the juice that drips from meat as the liquid in place of water or milk.

Grease Filter. Equipment for filtering rendered fats, consisting of a kettle, a plunger, a cloth-filter disk, and a collapsible adapter rack.

Grease Trap. A receptacle located in the dishwashing area of a food establishment to separate grease from waste water.

Greens. Vegetables which are leafy and green in color, such as kale, mustard greens, turnip greens, collards, and lettuce.

Griddle. An electric or gas-fired piece of equipment on which griddle cakes, eggs, bacon, or other foods are prepared.

Grill. To cook on a griddle, draining or scraping off fat as it collects.

Grinder Plate. A perforated metal plate through which meat is forced, to be sheared off by the knife in a meat grinder.

Grocery Department. The part of the commissary store where the items, other than meat or produce, are displayed for sale.

Ham. The thigh of any animal, especially a hog, prepared for food.

Hand Hot-sealing Iron. A special electric tool held in the hand through which sufficient heat is applied to a cellophane-wrapped package to seal it closed.

Hand Wrapping Machine. A machine having an electrically driven slicer and a hand-operated wrapper.

Hanging Tender. A cut of boneless meat for stewing or grinding attached to the open hindquarter and the kidney knob in the open hindquarter.

Hard Water. Water containing appreciable amounts of dissolved minerals, such as calcium, magnesium, and iron. Temporary hard (slightly hard) water is desirable in bread baking.

Hard Wheat Flour, Type I. A gritty-textured flour desirable for making breads because of its high gluten-forming content. It includes hard red spring, hard red winter, and hard white varieties of wheat.

Hash-Browned Potatoes. Boiled potatoes, chopped fine, seasoned, moistened with a little fat, packed to a depth of about 1 inch, browned on one side, turned, and browned on the other side.

Hearth. Heated baking surface or floor of an oven.

Heel. The part of the hind limb in animals that corresponds to the human heel; the back portion of the hind leg under the round, used for braising, stewing, or grinding.

Hepatic Artery. Artery to the liver.

Hemorrhage. Escape of blood from a blood vessel.

Hemoglobin. Coloring matter of red blood cells.

Herbs. Plants which grow mainly in the temperate zone and whose dry, leafy, and soft portions are used as seasonings for food.

Hindquarter. The back part of half of a carcass, divided usually between the twelfth and thirteenth ribs.

Histology. Study of minute structure of tissues and organs by microscopic examination.

Hock. The tarsal joint in the hind limb of quadrupeds, corresponding to the ankle of man.

Hopper. A chute, box, or receptacle, usually funnel-shaped, for delivering flour to mixing apparatus.

Hormone. Chemical compounds secreted by the ductless glands which, when conveyed to another gland of the body, increase functional activity and capacity for secretion.

Humidity. Moisture in the air.

Hydration Rate. Rate at which flour takes up water; the hydration rate has an effect on the mixing time.

Hydrogenation. A process by which edible oils are hardened to a plastic solid consistency by forcing hydrogen gas to unite chemically with the oil, using ground nickel as a catalyst.

Hydrogenated Shortening. Vegetable oil that has been converted to a solid shortening by the process of hydrogenation.

Hydrolysis. Chemical decomposition by which a compound is resolved into other compounds by taking in water.

Hygrometer. Instrument used to determine the percentage of humidity.

Hygroscopic Ingredients. Ingredients that readily absorb and retain moisture.

Ice. To frost or apply an icing of frosting.

Identification Plate. A plate on a piece of equipment giving Federal stock number, model number, and the number of the technical manual that covers the item.

Ileocecal Valve. Valve between the large and small intestine.

Immersion Heater. A heater used primarily to heat water for mess operations in the field.

Infection. Invasion of the tissues of the body by harmful, or pathogenic, organisms.

Ingest. Consume (eat or drink).

Ingredients. Food materials used to produce bakery products or prepared foods.

Inhibit. To check or restrain growth.

Installation Menu. The master menu as reviewed and revised by the installation menu board.

Instruction Plate. A plate attached to a piece of equipment giving operating instructions.

Intermediate Proofing. Giving the dough a short rest period (about 12 minutes) to recover from the effects of dividing and rounding.

Intermittent Electric Toaster. An automatic pop-up toaster with two or four toasting compartments. This toaster is authorized for field messes serving 100 men or less.

Inventory. Itemized list of goods and equipment on hand, together with a statement of the estimated worth or cost.

Invert Sugar. In pastry baking, simple sugar in a combination of dextrose and levulose brought about by heating cane or beet sugar with water and cream of tartar. In nutrition, a mixture of glucose and fructose resulting from the chemical breakdown of sucrose; it does not crystallize readily. In bread baking, a mixture of equal parts of dextrose and fructose. Invert sugar can be produced by the action of heat and acid on cane or beet sugar or by the action of the enzyme, invertase, on the cane or beet sugar.

Invertase. An enzyme in yeast which converts cane and beet sugar, or sucrose, into a simple form of sugar. The conversion is necessary before sugar can be used by the yeast for fermentation.

Insulin. The active substance of the internal secretion of the pancreas. It aids in the use of carbohydrates and proteins.

Intercellular. Between cells.

Irradiation. Treatment of fortification by ultra-violet rays.

Irritability. The ability to respond to a stimulus.

Isometric. Pertaining to or having equality of measure.

Isotonic. Pertaining to solutions having equal osmotic pressure.

Issue Cycle for Bread. The consumption cycle for issuing bread is the dinner-supper-breakfast cycle. Bread baked on Sunday will be issued for consumption for Monday's dinner and supper and Tuesday's breakfast.

Invoice. An itemized statement of merchandise shipped to a purchaser, with the quantity, prices, and charges annexed.

Jacket. A casing surrounding a container through which a fluid or steam can be passed to maintain a certain temperature.

Jejunum. Middle portion of small intestine between duodenum and ileum.

Jig. A support for holding a bag while it is being filled with produce.

Julienne. Thin strips. Julienne potatoes are raw potatoes cut lengthwise into strips and fried in deep fat. Julienne carrots are cut in strips.

Julienne Cutter. A plate used with an attachment on the vertical mixing machine to cut vegetables into strips.

Keratin. A protein that is the basic component of epidermis, hair, nails, and all horny tissue.

Ketone. An organic compound released in the metabolism of fats.

Kidney Knob. A large deposit of fat attached to the hindquarter near the spinal column. The kidney is imbedded in the kidney knob.

Kilocalorie. The amount of heat needed to raise the temperature of one kilogram of water one degree centigrade.

Kinetics. Branch of mechanics which treats of the action of forces to produce or change the motion of masses.

Knead. To fold and press dough firmly with palms of hands, turning between foldings.

Knife Pouch. A metal case, strapped to the waist, that holds the individual meatcutter's knives.

Knuckle. The knee or hock joint of a quadruped, used chiefly for soups and stews.

Lactalbumin. A protein in milk coagulated by heat; the scum formed when fresh milk is heated.

Lactase. An enzyme acting on lactose, breaking it down into glycose and galactose.

Lacteal. Any of the minute lymph glands which convey chyle (emulsified fat) from the small intestine to the thoracic duct.

Lactic Acid. An organic acid commonly found in sour milk.

Lactic Fermentation. A chemical change in which lactic bacteria convert sugar into lactic acid. This fermentation causes milk to sour.

Lactose (Milk Sugar). A form of sugar found in milk, with good food value but low sweetening value. It cannot be fermented by baker's yeast and remains a residual sugar.

Lady. In a lobster, a sac near the head which is removed with the intestines after the lobster is boiled.

Lard. Shortening made by rendering fatty tissue from hogs.

Larding. Covering lean meat or fish with strips of fat or attaching strips of fat with a skewer before cooking.

Lardoon. Long strip of salt pork, bacon, or suet used for larding.

Latent. Hidden, its presence concealed; not visible or apparent, as in the phrase, "latent deficiencies of vitamins."

Leacher. Cylindrical container which holds leacher bag of ground coffee.

Leacher Bag. Cloth bag to hold ground coffee while hot water is sprayed over the coffee.

Leavening. The result of the chemical action that creates carbon dioxide gas, which, caught in the gluten network, expands and causes the dough mass to expand.

Leavening Agent. Ingredient used to produce carbon dioxide gas in doughs and batters.

Ligament. A band of tissues which connects bones or holds organs in place.

Liner. A container in a coffee urn which holds coffee until it is drawn off through faucets.

Lipase. An enzyme which splits fats. Also called liptolytic juice.

Lipid. An all-inclusive term for fats.

Liquid Ferment Process. A process in which fermentation is carried on without flour; commonly referred to as stable ferment, broth process, or brew process.

Liquid Whole Milk (Fresh Milk). Milk obtained from cows, untreated except for pasteurization and composed of about 88 percent water, 8.5 percent nonfat solids, and 3.5 percent milk fat.

Liquid Sponge. Liquid ferment containing a small percentage of flour.

Loin. The part of a quadruped on either side of the spinal column between the hipbone and the false ribs; the front part of a hindquarter of beef, lamb, pork, or veal with the flank removed.

Long Saddle. The section of lamb, including the legs, loin, and rack, which produces desirable roasts.

Low-grade Flour. Flour containing considerable bran and dirt, obtained from the last stages of milling, used for animal feed and not for bakery foods.

Lyonnaise Potatoes. Boiled sliced potatoes, added to sauteed onions and then cooked until browned.

Lyster Bag. See Water Sterilizing Bag.

Makeup. In bread baking, the dividing and scaling, rounding, intermediate proofing, molding, and panning of the fermented bread dough. In pastry baking, the process of producing individual items from a large mass of dough.

Maltase. An enzyme which converts malt sugar, or maltose, into dextrose, which is then fermentable by yeast.

Maltose (Malt Sugar). A compound sugar found in malt and, in small quantities, in flour. It is formed by the action of the flour enzyme, diastase, on starch.

Manifold. A set of spray arms which deliver wash water or rinse water to the dishes in a single-tank dishwashing machine.

Marinade. A pickle in which meat, a vegetable, or fish is soaked to improve its flavor.

Marinate. To let lie, as meat or fish, in a brine or pickle; to place in oil, cream, milk, vinegar, french dressing, or lemon juice for a period of time to alter the flavor, improve the flavor, or soften the product.

Master Menu. The menu developed each month by the pertinent command for installation commissary officers, containing a menu for each meal in the month, a recipe number from the TM 10-412 series for the main items, other recipes with the necessary ingredients and amounts, and an accessory and condiment list. See Installation Menu.

Mayonnaise. The semisolid emulsion of edible vegetable oil, egg yolk or whole egg, vinegar and/or lemon juice, and one or more of the following: salt, seasoning, sugar, and dextrose.

Meal. Coarsely ground grain; unbolted wheat flour.

Meal Basis of Issue. The procedure wherein the subsistence articles issued for one particular day contain the quantities of food for the number of individuals expected to subsist for each meal.

Measuring. Apportioning ingredients by volume or weight.

Measuring Cup. A standardized cup used for accurate measure.

Measuring Spoons. Set of standardized spoons, including tablespoon, teaspoon, and fractions of teaspoon sizes, used for accurate measurement.

Meat Bloom. A state of beauty, freshness, and vigor; the eye appeal of fresh meat.

Meat Boning Hook. A 3-inch tool, with a wooden T-handle, used to hold meat during the boning operation.

Meat Cutting Bandsaw. Equipment for cutting fresh carcass meat, wholesale cuts, frozen meat and fish, consisting of a stationary table and a movable table which can be pushed back and forth past a vertical, continuous bandsaw driven by an electric motor. Meat grinder is an electric power-operated machine for grinding boneless meat and fat. Meat slicer is equipment for slicing raw and cooked boneless meat, cheese, and vegetables, consisting of a feeder platform and a revolving knife operated by an electric motor.

Meat tenderizer is an electric gravity-feed machine for tenderizing steaks and blending small pieces of meat into tenderized steaks.

Medium Rye Flour. Rye flour with a dark color; as much as 30 percent can be mixed with wheat flour to make bread.

Melting Point. The temperature at which a solid becomes a liquid.

Menu. Bill of fare.

Mesophilic. Growing best at moderate temperatures.

Mess Officer. The representative appointed by the commanding officer to supervise the operations of the messing facilities of a command.

Mess Steward. The noncommissioned officer responsible for the detailed operation and control of the mess.

Messkit Predip. A procedure in which messkits are sanitized and warmed in a corrugated can of boiling water before being used.

Metabolism. The sum of the processes or chemical changes in an organism, or in a single cell, by which food is built up (anabolism) into living protoplasm and broken down (catabolism) into simpler compounds with the exchange of energy.

Milk Fat. A food element in milk contributing approximately 3.50 percent to the composition of cow's milk.

Milk Solids. All of cow's milk except the water.

Mince. To cut or chop fine.

Mincemeat. A mixture of chopped apples, spices, suet, raisins, and sometimes meat, used as pie filling.

Mineral. In bread, ash which consists of phosphates of lime, magnesium, and potassium.

Mineral Yeast Food (Dough Conditioner). A group of mineral salts essential in dough fermentation and conditioning which are sometimes added to a dough formula if they are not present in the correct amount. They condition soft water or neutralize alkaline water. The mineral yeast food increases the yield and generally improves the quality characteristics of the loaf.

Mixer. Mechanical equipment in which dry and liquid ingredients are blended and mixed.

Mixing. Combining ingredients to the degree necessary to form batters and doughs.

Mixing Machine. Machine equipped with a bowl and various agitators, used for mixing ingredients such as doughs and batters.

Mobile Kitchen. A converted general-purpose 2 1/2-ton truck with all equipment necessary to prepare, cook, serve, and store food.

Moist Heat. Heat used to cook food when liquid is added to the pan of food. The moist heat methods are boiling, braising, simmering, and steaming.

Molasses. Light to dark brown sirup obtained as a byproduct in making cane sugar.

Mold. Cells larger than bacteria or yeast that grow on organic matter; a bread disease; tiny visible vegetable plant that roots itself in bread or bakery products, forming velvety-textured spots on the loaf or the bakery product. Mold may be either harmful or helpful.

Molder. A machine in which pieces of dough are received from the intermediate proofer and shaped and sealed into the final loaf form.

Molding. The forming of the dough pieces by hand or machine into the shape desired for the finished loaves of bread.

Molding Machine. A machine designed to form meat or fish into patties or blocks.

Molecule. One unit of a group of bound atoms. All molecules of a substance are the same and have the same properties as the mass of the substance.

Monosaccharide. A simple sugar such as glucose, fructose, or galactose.

Monosodium Glutamate. A vegetable protein derivative which sensitizes the taste buds; the natural flavor of food to which it has been added can be tasted to a greater degree. No additional flavor is added to the food.

Mutton. Flesh from sheep 20 months or more in age.

Navel. See Plate.

Night Soil. Human body wastes (feces or urine) used as fertilizer in certain parts of the world.

Nonperishables. Subsistence items such as canned and dried foods that do not require refrigeration; also called dry stores.

Nonyeast-food Dough. Dough prepared without the addition of mineral salts.

Nutrient or Nutriment. A substance which nourishes. Food or a component of food.

Offal. The parts, especially inedible parts, removed in dressing a butchered animal.

Officer Field Ration Mess. A field ration mess established specifically for officers and warrant officers.

Old Dough. Dough which has fermented too long or at too high a temperature.

Open Mess. A nonappropriated sundry fund activity set up to provide messing, billeting, and recreation for officers, warrant officers, noncommissioned officers, and their dependents.

Operational Ration. A ration with nonperishable items, prescribed for all individuals performing operational duty outside the Zone of Interior.

Organic Acid. An acid which contains carbon. However, carbonic acid is the exception.

Orifice. A mouthlike opening or hole.

Osmosis. The tendency of a fluid to pass through a semipermeable membrane into a solution whose concentration of solids is higher, thus equalizing conditions on both sides of the membrane.

Osmotic Pressure. A physico-chemical property shown by a substance in solution. Under these conditions water passes through the membrane into the more concentrated solution.

Overscaling. Adding an ingredient in excess of the correct amount.

Oven Cycle. The allotted time between bread doughs, including baking time, unloading time, and oven recovery time; under normal operating conditions a 50-minute oven cycle is used in a garrison bakery.

Overload Protector. A device built into the motor of an electric meat grinder to protect the motor from abnormal current that may occur when the grinder is started.

Oven Capacity. Maximum pounds of bread that can be baked per oven.

Ovenspring. Rapid expansion of dough during the first few minutes of baking.

Overrun. In the reconstitution of dehydrated ice cream mix, a desired increase in the volume resulting from air being whipped into the ice cream; the desired overrun is 100 percent.

Ovulation. Expulsion of eggs from an ovary.

Oxidation. The process in which oxygen combines with another substance.

Oxyhemoglobin. The compound formed when oxygen is carried by hemoglobin in the blood.

Oyster. A member of the family of marine bivalve mollusks. A small oval of tasty dark meat contained in the hollow of the back in front of the hip socket in fowl, especially turkey.

Pans. Variously shaped metal containers. For bread baking, a broad, deep, metal vessel. Pan truck is a small movable platform on casters for carrying pans from the oven to the molder in a bakery.

Pan-broil. To cook in a dry, hot frying pan, pouring off fat as it cooks out of meat.

Pancreas. A gland located near the stomach.

Panfry. To fry in a small amount of fat.

Pan-glazed utensil. A utensil coated with a resinous silicone developed to replace pan grease.

Panning Bread. Carefully placing the loaves of bread with the seam down, into greased or glazed pans.

Panning Vegetables. Cooking vegetables, especially succulent ones, by a method in which a small amount of fat is used and the vegetables cook in their own juices.

Panproofing Bread. Storing the panned loaves of bread under controlled temperature and humidity conditions for 30 to 60 minutes before baking them.

Parasite. An organism deriving its nourishment from the living animal or plant upon which it lives.

Parboil. To boil in water until food is partially cooked.

Pare. To remove the skin or rind from any food with a knife or other suitable instrument.

Parkerhouse Rolls. Folded buns of fairly rich dough.

Pasteurization. The partial sterilization of a fluid at a temperature which destroys certain disease-causing organisms and undesirable bacteria; milk is heated to 142° Fahrenheit for 30 minutes and promptly cooled to 50° Fahrenheit or lower.

Pastry Bag. Horn-shaped cloth bag used for tubing soft dough, frostings, and icings.

Pastry Chef. A cook specially trained to make pastry.

Pastry Knife. An accessory of the vertical mixing machine, used to cut shortening into flour.

Patent Grade. The best grade of flour; it contains a minimum of bran specks and is capable of yielding an excellent quality gluten that is desired for breadmaking. It constitutes 40 to 90 percent of the best part of total flour.

Pathogenic. Disease-causing.

Pectin. A neutral substance, apparently of several different varieties, occurring in many vegetable tissues. It is used as an ingredient of jellies to stiffen them.

Peel. To remove skin by pulling, scraping, paring, or brushing.

Pekar Test. Method of testing the comparative shades of flour.

Pelvic Bone. The aitch and hipbone together.

Pepsin. An enzyme produced in the stomach which, in the presence of hydrochloric acid, splits proteins into proteoses and peptones.

Percent Relative Humidity. The amount of moisture in the air in proportion to the total amount the air can hold at a given temperature.

Percentage Yield. The weight of meat cuts compared to the weight of the carcass or wholesale cut and expressed as a percentage. A 347-pound side of beef yielding 22 pounds 4 ounces of steaks results in 6.41 percent yield.

Percolate. To filter; to cause hot water to filter through coffee to extract its essence.

Perquisite. A gain or profit made incidentally from employment in addition to regular salary or wages.

Personal Hygiene. Principles and rules designed to promote personal health and cleanliness.

Peripheral. Along the outside edge of; as, a peripheral nerve.

pH. Measure of acidity or alkalinity.

Phosphate. A chemical which promotes yeast activity.

Photosynthesis. Process by which plants convert carbon dioxide and water into starch and cellulose (plant tissues) by means of the sun's energy and the chlorophyll in the plant.

Phospholipids. Fats containing nitrogen and phosphorus.

Pituitary. Gland which affects most body functions.

Plate (Navel). The thin underportion of the forequarter of beef, used for braising, stewing, or grinding.

Pliofilm. A glossy, moistureproof, elastic packaging material made of rubber hydrochloride.

Poach. To cook food in a simmering liquid; to cook egg in a hot liquid below the boiling point.

Polluted. Impure or unclean; for example, a water supply polluted by sewage.

Polysaccharide. A complex sugar.

Portion Control. Serving a specified portion of food at a set price that will return a desired amount of money.

Pot Roast. A method of cooking less tender meats; meat cooked in water, with or without previous browning.

Potable. Drinkable.

Poultry. Domesticated birds used as foods. The Armed Forces use chickens and turkeys.

Precursor. A substance which is converted into another substance, such as carotene, the precursor of vitamin A.

Preflushing Machine. A machine used to remove scraps from plates and trays before they are placed in a dishwashing machine.

Prepackaging. Making up consumer-size packages of meats or produce before displaying them for sale to the customer.

Primal Cuts. The first large cuts of a meat carcass.

Process. To cut and trim large cuts of meat into ready-to-cook size.

Proof. To allow panned yeast products like bread to approximately double in size under controlled atmospheric conditions. Proof box or cabinet is storage space where atmospheric conditions suitable for proofing of dough may be maintained. Proof racks are for carrying loaves of dough from the molder to the proofroom and from the proofroom to the oven. Proofroom is an insulated air conditioned metal box where atmospheric conditions suitable for final proofing of dough may be maintained.

Proofing Period. Time period prior to baking, during which panned yeast products are allowed to approximately double in size.

Protease. A chemical in flour that softens gluten. It is an enzyme capable of converting proteins that cannot dissolve in water into a form that will dissolve in water.

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Protein. A nutrient substance containing carbon, hydrogen, oxygen, nitrogen, and sometime sulfur, phosphorus, and iron. It may be either animal or vegetable and is present in all living tissue. In baking, it is a substance in flour which combines with water to form gluten which gives strength and adhesiveness and retains leavening gas in a loaf of bread.

Prothrombin. The precursor of thrombin, which is necessary for clotting blood.

Protoplasm. The essential substance of both the cell body and nucleus of cells of animals and plants. Regarded as the only form of matter in which the phenomena of life are manifested.

Protozoa. One-cell animals.

Provitamin. A chemical substance that must be changed by the body into a usable vitamin.

Psychorphilic. Growing best at cold temperatures.

Ptyalin. An enzyme found in saliva which converts starch into dextrins and maltose.

Puff Paste. Rich pastry with baker's margarine rolled into the dough for added flakiness.

Pullman (Sandwich) Bread. Bread made by using standard formulas but baked in long rectangular pullman bread pans with a cover on top.

Pump Impeller. A part in a preflushing machine which draws water from a tank and forces it through a gusher tube.

Pump Intake Plate. A metal plate, in the pump of a preflushing machine, which controls the height of water gushing from the gusher tube.

Punching. Pressing down and folding the bread dough mass to expel some of the carbon dioxide gas formed during fermentation and to relax the gluten after the constant tension of stretching so it can strengthen and develop.

Puree. To press food through a sieve or a food mill.

Putrefaction. The process of decay of proteins, accompanied by a disagreeable odor.

Pyloric Valve. Valve leading from the stomach into the duodenum.

Pyrometer. A heat-indicating device sometimes used in ovens in place of a column thermometer.

Quartering. Cutting fowl or a carcass into quarters.

Quick Bread. Batters or doughs for making items leavened by baking powder, such as biscuits, muffins, and cornbread.

Rack. The rib section of a lamb carcass.

Rail Cutting. A method used in centralized meatcutting activities in which the primal cuts are made while the carcass is in a hanging condition.

Rancidity. Fat deterioration caused by oxidation. The fat takes on a tallow flavor and odor.

Range. A stove for cooking, baking, or heating water in a garrison mess. The stove may be heated by gas, electricity, oil, wood, or coal.

Rape Seed. The seed of rape, a plant related to the turnip, used in a volumeter to measure volume of bread in cubic centimeters.

Ration. The allowance of food for 1 person for 1 day.

Ration Articles. Classification of the basic foods of the Army ration, and proper substitutes for them, as listed in Army regulations.

Ration Basis of Issue. The procedure wherein the subsistence issued for one particular day contains the quantities of food for an equal number of breakfasts, dinners, and suppers.

Ration Breakdown Point. A consolidating headquarters in which rations are drawn and issued to subordinate units.

Ration Cycle. Time covering one day's ration or three meals. It may begin with any meal.

Ration Factor. Average daily rate of issue per man of a subsistence item over a given period of time; usually expressed in pounds per 1,000 rations. Poundage or units of a subsistence item required to supply 1,000 persons per day in a specific feeding group for a given period of time.

Ration in Kind. Actual food items issued for consumption; items may be cooked or uncooked.

Ration Interval. Time between submission of the field ration request and the consumption of the food.

Ration Issue Frequency. Scheduled number of times and sequence within a week that rations are issued.

Ration Scale. Subsistence requirements expressed as ration factors of a command for a given period of time.

Ration or Meal Status. The number of rations or meals overdrawn or underdrawn for a given period.

Ration Supplement. Items used to supplement designated operational rations. A ration supplement, sundries pack, is issued for use in the field to provide essential articles, tobacco, and confections prior to the establishment of adequate army exchange facilities.

Ration Strength. For the field ration, the actual number of persons present for meals. For the garrison ration, number of persons present for duty who are entitled to a ration.

Ready-to-Cook Poultry. Any dressed poultry from which protruding pinfeathers, vestigial feathers, head, shanks at the hock joint, crop, oil glands, trachea, esophagus, entrails, reproductive organs, gall bladder, and lungs have been removed.

Rear Area Mess. Semipermanent mess set up as close as possible to the combat area but far enough to the rear to be relatively safe from ground attack.

Reconstitute. To restore to the normal state, usually by adding water. Dry milk is reconstituted to fluid milk with the addition of water.

Reduction. A chemical process involving the addition of the element hydrogen.

Reel Oven (Ferris-wheel or Revolving-tray Oven). An oven in which the hearth consists of trays mounted on rings, the arrangement being similar to the manner in which seats are installed on a ferris wheel.

Relish. A taste; characteristic flavor; a quantity just sufficient to flavor; something taken with food to render it more palatable or to stimulate appetite; a condiment; a side dish consisting of different vegetables, fresh or pickled, for the purpose of giving zest to the food with which it is served. To enjoy; to eat or drink with pleasure.

Render. To melt and separate fat from meats by heating slowly at low temperatures.

Rennin. The milk curdling enzyme of the gastric juice; found chiefly in the stomach of the immature animal.

Replacement Stream Personnel. Those individuals in a travel, training, or otherwise unassigned status.

Respiration. Breathing; the act of inhaling air and exhaling carbon dioxide and water.

Retail. To sell directly to the consumer. In meatcutting, retail cuts are small cuts of meat.

Retail Cuts. The cuts of meat in sizes to be sold to a consumer, such as steaks, chops, roasts.

Rib Fingers. Long strips of meat taken from between ribs and used for stewing or grinding.

Rib Steak. A steak cut from the rib portion of the forequarter, including a portion of the rib bone.

Riboflavin. Vitamin B_2.

Riced Potatoes. Boiled potatoes forced through a ricer or coarse strainer.

Ripening Dough. Maturing the dough. Dough becomes mature as the result of changes in the combination of starch and gluten. A secondary action of fermentation which makes dough spongy and results in light, easily digested bread.

Roast. To cook by dry heat, usually in an oven.

Roasters. Quick-grown, meaty chickens over 2 1/2 pounds with less flexible breastbones than those of broilers-fryers.

Roll. To revolve by turning over and over; to wrap round on itself or something else; to press or level with a roller; to cover pieces of food with flour, cornmeal, or crumbs.

Roll-In. Rolling of fat into a dough in layers.

Rope. A bread disease caused by the bacteria, Bacillus mesentericus, which break down the cells and leave a sticky, pasty mass.

Rounder. A machine in which pieces of bread dough are shaped to a firm ball with a smooth, unbroken surface. Rounding is shaping a dough piece by hand or machine into a firm ball with a smooth unbroken skin over its entire surface.

Roux. A cooked mixture of flour and butter or other fat used to thicken soups or to make gravy or sauces.

Rump. The piece of beef behind the upper end of the sirloin in the hindquarter of beef.

Rye Bread. A variety bread containing white flour, rye flour, and sometimes caraway seeds. Rye flour is a finely ground product prepared from rye grains, having the same amount of proteins as wheat flour; however, gluten cannot be formed from it.

Salami. A type of uncooked sausage that is smoked or air-dried and keeps indefinitely in a dry atmosphere.

Salt. The product of the reaction between an acid and a base. (See Sodium Chloride.)

Salt Concentration. Percentage of salt present in a dough which affects the leavening action of yeast. Certain salts promote yeast activity; others retard it.

Sanitation. Use of sanitary methods; the principles and practice of cleanliness as related to disease.

Sanitize. The process of rinsing an article with clean water having a temperature of 180° F. or higher after the article has been cleaned in soap or detergent.

Saponification. The breaking down of fats or oils by an alkali. Conversion of fat or oil into a permanent emulsion.

Saprophytes. Organisms that require dead organic matter for their food, such as those that disintegrate dead animals.

Saturation. Absorption to the limit of capacity.

Sausage. Meat, especially pork, minced and highly seasoned, and enclosed in an intestine of some animal.

Saute. To fry lightly and quickly in a small amount of fat on top of the stove while turning the food over frequently.

Scald. To heat liquid to a point just below the boiling point.

Scale. A small, flattened, rigid plate forming part of the external body covering, especially in fish and reptiles. In bread baking, a measuring device for dough, usually placed beside the divider.

Scaling. Apportioning batter or dough according to unit weight.

Scallop. One of the marine bivalve mollusks having the shell radially ribbed and the edge undulated. To bake food, usually cut into pieces, with a sauce or other liquid.

Scorch. To parch the surface by heat; to heat so as to change color and texture.

Score. To cut shallow slits or gashes in the surface; to cut shallow slits in a food item with a knife, fork, or other implement.

Scoring. Evaluating finished goods for the purposes of detecting defects and determining causes and remedies.

Scrap Basket. A steel basket in a preflushing machine. The basket traps food scraps.

Scrapping Plate. Part of a preflushing machine for dishes. The scraps are flushed onto the scrapping plate.

Scribing. Marking a line. The bones in the back of a carcass are scribed at the packing house with a saw to mark the place where they should be broken and trimmed.

Sea Water. Water containing varying amounts of salt, used as a bread ingredient only in theaters of operation where fresh water is scarce; never used until the Army Medical Service approves its use. When it is used, the salt is usually omitted from the formula.

Sear. To burn the surface of; to brown the surface of meat by a short application of intense heat to develop flavor and improve appearance.

Seasoning Salt. Garlic, onion, or celery salt.

Sediment Cup. A removable cup that fits in the sump of a deep fat fryer.

Senility. State of showing the characteristics of old age.

Shank. The lower part of the leg; in beef, a cut from the upper part of the foreleg used for stew; also, a cut from the hind leg beneath the round.

Sharpening Stone. A multiple stone having three stones (coarse, medium, and fine) mounted in a case with an oil reservoir in the base and used for sharpening the cutting edge of cutlery.

Sheave. A grooved wheel or pulley.

Shell Eggs. Fresh or refrigerated storage eggs.

Shellfish. An aquatic animal without a backbone, having a shell.

Shirred Eggs. Eggs broken into a dish, sometimes with cream or crumbs, and baked in an oven or over the fire until slightly firm.

Short Ribs. Portions of the rib and brisket meat cut from the ribs and used braised or stewed.

Shortening. In bread baking, edible fat or oil used in a bread dough to lubricate the dough; it makes the dough more pliable and produces a more tender product. In pastry baking, the fat or oil used to make pastry brittle or crisp.

Shoulder Clod. A cut from the shoulder of beef.

Shred. To cut or tear into thin strips or pieces using a knife or shredder.

Shredder. A plate used with an attachment of the vertical mixing machine to cut or tear vegetables into small pieces.

Shrimp. A small, marine crustacean with a slender body, long legs, and a depressed abdomen.

Shrink. The difference between tag weight and actual weight of a meat carcass or wholesale cut.

Shrink Tunnel. Equipment consisting of a metal tunnel about 2 feet long with a heating unit. Packages are processed in special heat-shrinkable film.

Shuck. To remove from the shell; as, to shuck oysters, clams, or scallops.

Side Paper-feed Machine. A bread slicing and wrapping machine with the paper feed on the side. The operator must feed the loaves separately onto spaced sections of the conveyor belt.

Sifter. A machine in which flour and other dry ingredients are sifted, aerated, loosened, and blended.

Sifting. Passing through fine mesh for blending or aerating or for removing foreign or oversize particles.

Simmer. To cook in a liquid at a temperature just below the boiling point (185° to 200° Fahrenheit). Bubbles form slowly and break below the surface of the liquid.

Simple Sugar. Sugar upon which yeast can act directly to form alcohol and carbon dioxide gas. Principal simple sugars important in baking include dextrose, fructose, and invert sugar.

Simple Sirup. A sirup made by dissolving and cooking white sugar in water, usually in the ratio of 6 parts of sugar to 4 parts of water.

Single-tank Dishwashing Machine. A spray-type machine in which dishes and cutlery are washed and rinsed in the same tank. It consists mainly of a dishwashing chamber with sliding access doors, a 20-gallon wash water tank, and a pump and assembly motor.

Sirloin. The hindmost portion of the loin in the hindquarter of beef; the cut next behind the porterhouse cut.

Sirloin Tip. The portion of the hindquarter above the kneecap and in front of the legbone (round bone) of a beef carcass, used for steak and for roasts.

Skewer. A pin for fastening meat to a spit or for keeping it in form while roasting. To fasten meat or poultry with a thin metal pin.

Skid. A pair of supports on which heavy objects are slid.

Skirt. A boneless cut of meat attached to the ribs and plate meat, used for stews and grinding.

Slicer. A plate used with an attachment on the vertical mixing machine to slice vegetables.

Slicing. Cutting loaves of bread into slices, usually mechanically.

Soakage Pit. A hole in the ground so constructed that liquid waste will drain away from the solids; solid wastes are burned or buried.

Sodium Chloride. Ordinary table salt. The primary function of salt in a dough is to bring out the taste and flavor of bread. Another function of salt is to tighten up and give stability to the gluten, thereby helping to produce bread of desirable structure with small cells separated by thin walls. Salt also controls the rate of fermentation.

Sodium Diacetate. Inhibitor used to prevent rope and mold in bread.

Sodium Propionate. A chemical used as a rope and mold inhibitor in a bread formula.

Soft Water. Water relatively free of dissolved minerals. It forms a heavy lather when shaken with soap in a closed container. In bread baking, it softens gluten and produces a sticky dough; increasing salt slightly or using mineral yeast food usually corrects undesirable effects.

Soft Wheat Flour, Type II. A smooth, powdery-textured flour desirable for cakes and cookies; it includes soft red winter, soft white, and white club varieties particularly adapted to chemically leavened baked products.

Solenoid Valve. An electrically operated valve that automatically shuts off oil supply in an oil-fired range; a control which regulates oven temperature by automatically rationing the gas input to the burner in a gas oven or by automatically shutting off electricity in an electric oven.

Solidifying Point. Temperature at which a liquid changes to a solid.

Soy Sauce. A Chinese and Japanese sauce prepared from soy beans, used with fish, meat, and other foods.

Spareribs. A cut of meat, especially from pork, consisting of the thin end of the ribs.

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Spatula. A flexible, knifelike implement for lifting foods from a griddle.

Spermatozoon. Male organism in semen which fertilizes the female ovum.

Spices. The roots, bark, stems, leaves, buds, seeds, or fruit of aromatic plants; any of various aromatic vegetable products used in cookery to season and flavor food.

Spit. A slender, pointed iron for holding food over a fire.

Splash Curtains. Curtains at the ends of an automatic dishwashing machine to prevent water from leaving the machine.

Spleen. Gland located near cardiac end of stomach.

Sponge. The first dough mass in the sponge-and-dough method in breadmaking. Sponge-and-dough method is a system of mixing dough in which two mixing periods and two fermentation periods are used; part of the ingredients are mixed and allowed to ferment before the remaining portions are added. Sponge dough is the final dough mass in the sponge-and-dough method of mixing.

Spotted Crust. A bread crust with darkened areas resulting from uneven distribution of sugar or flour over the surface. Excess humidity in a proof box also causes spotted crust.

Stain Remover. A chemical compound developed to remove coffee, tea, and fruit stains from plastic and china tableware and coffee stains from stainless steel urns. It is not suitable for use with aluminum utensils.

Standard B Ration. A ration with nonperishable foods, used for large group feeding in situations where perishable foods are unavailable; ration weighs about 6 pounds and contains about 4,400 calories.

Starch. A complex sugar present in practically all plants; a white, odorless, tasteless, carbohydrate. In breadmaking, starch gives bulk to the dough; during fermentation some starch is changed to maltose sugar by the enzyme diastase, found in flour.

Steak Knife. A knife 10 inches long for cutting roasts and steaks.

Steam. The invisible gas or vapor into which water is converted when heated to the boiling point. To expose to the action of steam; to cook in steam with or without pressure.

Steam Cooker. A cooker, used in garrison messes, in which food requiring moist heat cooking is cooked with steam in direct contact with the food. The cooker has two or three compartments, each with a capacity of about 2 bushels.

Steam Table. A table with openings to fit inserts which hold food to be kept hot over hot water until the food is served.

Steam-Jacketed Kettle. Large pot-shaped vessel used for cooking food by steam; the kettle can be used for rendering fat.

Stearin. Fat, notably beef and mutton fat.

Steel. A round magnetized steel shaft with a wooden handle and a guard between the handle and the steel proper. Steeling is straightening the edge of a knife which has been sharpened.

Steep. To soak in a liquid; to extract the essence of by soaking; to add a food such as tea to boiling liquid which has just been removed from the source of heat and to allow it to stand in the liquid for a given time; to let stand in a liquid just below boiling point to extract flavor, color, or other qualities from specific food.

Sterilization. Destruction of all micro-organisms by chemical or physical methods.

Sterols. Group of chemically-related, fat-soluble substances. Provitamins D, ergosterol, and cholesterol are members of this group.

Stew. To simmer in a small quantity of liquid. A dish prepared by stewing.

Stifle Joint. The joint next above the hock in the hind leg, corresponding to the knee in man.

Stir. To disturb the relative particles of a substance by passing something through it; to blend two or more ingredients, using a circular motion with a spoon or other suitable instrument.

Stock. Liquid in which meat and/or vegetables have been cooked; a rich extract of the soluble parts of meat, fish, or poultry, used as the base for soups or gravies.

Stock Yeast. A supply of yeast prepared from potatoes, salt, water, yeast, and sometimes flour to be used as a supplement to dwindling yeast supplies.

Stockmen. Clerks who replace stock on shelves of a grocery market.

Stomper. A wooden or aluminum implement for pressing food into the worm of the grinder.

Straight Flour. The total run of patent and clear flour produced during the milling of wheat. Straight flour contains all the wheat berry except the bran and is termed 100 percent extraction flour. It is the type flour procured by the Armed Forces. Although straight flour is lower in quality than patent flour, it can be made into nutritious bakery foods.

Straight-dough Method. A system of mixing dough in which all the dough ingredients are mixed at one time and prepared for a single fermentation period.

Strong Flour. Wheat flour which is capable of producing tough, elastic gluten and which will produce good, well-developed loaves of bread.

Stuffed Straight Flour. Flour resulting when clear flour is added to straight flour.

Subsistence Quality. Pertains to type, class, or grade and any other attribute of subsistence except wholesomeness.

Subsistence Wholesomeness. Pertains to health and medical aspects or other conditions which may render subsistence unacceptable for consumption.

Sucrase. An enzyme which breaks down sucrose into glucose and fructose.

Sucrose. A compound sugar composed of equal quantities of dextrose and fructose extracted from sugar cane and sugar beets.

Sugar Concentration. Percentage of sugar present in a dough. Both too little and too much sugar retard leavening.

Sulfate. A chemical which promotes yeast activity.

Sump Pit. A pit or reservoir serving as a drain or receptacle for fluids.

Surcharge. Money collected from persons authorized to subsist with reimbursement in a field or garrison mess; it is established by the Department of Defense and covers operating costs over the basic food cost.

Sweetbread. The commercial name for the thymus gland in cattle.

Swiss Steak. Steak cooked by the moist heat method.

Symmetry of Form. Balanced proportions or absence of deformity in a loaf.

Synthesis. Preparation of a compound from its constituent elements.

Systolic. Peak of blood pressure in an artery. Opposite of diastolic.

Table D'Hote. A complete meal in a restaurant or hotel for which one pays a fixed price.

Table Cutting. A method in which a carcass is completely cut, boned, and trimmed on the table.

Tailings Box. Compartment in a flour-handling unit where foreign matter separated from the flour collects.

Taste. Sensation one receives when one chews food.

Temper. The state of a metal as to its hardness or toughness. To regulate, especially by moderating.

Tempering. Adjusting temperature of ingredients to a certain degree.

Tenderloin. The long, tapering muscle that lies along the backbone inside the loin.

Tensor. A muscle that stretches a part.

Testing. Examining cake or bread at the oven for doneness. Checking product or ingredients for quality according to a set method.

Texture. Interior grain or structure of a baked product as shown by a cut on the surface. The feel of a substance under the fingers.

Texture of Bread. Internal quality of the loaf. The bread should feel velvety, soft, and elastic rather than rough, harsh, doughy, crumbly, or lumpy.

Thermometer. An instrument for determining the temperature of a body or space.

Thermophilic. Growing best at high temperatures.

Thermostat. An automatic device for regulating temperature.

Thorax. That part of the trunk of the human body between neck and abdomen.

Thread. A test for determining the proper degree of heat necessary to prepare boiled icing and candy. When sugar and water are heated to a temperature of approximately 240° Fahrenheit and a sample is dropped from a spoon, thread-like formations appear.

Till. A box.

Tine. A tooth, as of a fork; a prong.

Tinplate Pans. Baking pans made of a sheet of steel coated with pure tin about 1/10,000 of an inch thick.

Toast. To brown a dough or batter product either over or under a direct source of heat.

Tonus. Muscle tone; that is, a sustained state of partial activity.

Top Round. A cut of beef taken from inside the round (leg) bone, used for steaks and roasts.

Toss. To mix lightly two or more ingredients. Tossing is a method generally used in combining salad ingredients.

Toxin. Waste product given off by an organism.

Trabecula. Structural center of a bone.

Trachea. The windpipe.

Transient Field Ration Mess. A mess for persons authorized the field ration and present during meal hours in the unit but not part of the morning report strength of the unit.

Traveling-hearth Oven (Traveling Plate or Tunnel Oven). An oven in which the hearth consists of a series of [illegible] plates mounted on endless conveyor chains which move from the front to the rear of the oven.

Traveling-tray Oven. In the bakery, an oven in which the hearth consists of trays mounted on endless conveyor chains which move from the front to the rear of the oven.

Triangle. The section of lamb, consisting of the shoulders, neck, breast, and shanks, which produces ground meat and meat for stews and roasts.

Trichinosis. A disease caused by a small parasitic worm. It is usually transmitted through infected pork not sufficiently cooked.

Trimming Produce. Cutting away wilted or damaged portions from produce like celery, lettuce, corn, or cauliflower so that the produce remains in good condition, is free of rot, and presents an attractive appearance.

Trisodium Metaphosphate. A chemical compound used to clean the stains from the liners in a coffee urn.

Trough. A large rectangular container, usually on wheels, used for holding large masses of yeast dough.

Truss. To bind or fasten securely. Trussing is a method used mainly in cooking poultry.

Trypsin. An enzyme of the pancreatic juice capable of converting proteins into peptones.

Tubing. Pressing a substance through a decorating or other type tube.

Twisting Bread Dough. Combining two half-weight units of dough molded in the conventional manner into a single unit by twisting them together.

Urea. Principal nitrogenous end product of catabolism of proteins in the body.

Vacuum Coffee Maker. Equipment consisting of a lower bowl, an upper bowl with stem, a filter, and a vacuum seal to make coffee for small detachments of men. Each coffee maker makes 12 cups.

V-belt. A circular belt, shaped to fit into the grooves of sheaves, which transmits power from one sheave to the other.

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Veal. The flesh of a young bovine of either sex usually less than 1 year old.

Vegetable Cook. A cook specifically responsible for cooking vegetables.

Vegetable Cutter. A hand-operated cutter used to cut vegetables into various shapes depending on the type of attachment being used.

Vegetable Oil. Liquid shortening usually obtained from corn, peanuts, soybeans, or cottonseed. The quality of bread made with liquid shortening is the same as that made with solid shortening but the volume is slightly smaller.

Vegetable Peeling Machine. A machine in which vegetables are agitated so that the surfaces come into contact with abrasive carborundum and the skins are removed.

Vegetable Seasonings. Vegetables such as onions, garlic, chives, and parsley which add flavor when used with other foods.

Vegetable Shortening. Shortening obtained from the seeds (cottonseed, peanuts, soybeans, or a combination of these) of oil-bearing plants.

Vegetable Trimmer. Equipment for trimming lettuce, celery, corn, and cabbage consisting of a pedestal-mounted housing with an electrically driven, recessed, rotating blade.

Vendor. Seller or commercial supplier.

Vent. The anus.

Vertical Mixing Machine. A machine with a motor-driven shaft to which various accessories are attached for mixing, beating, or whipping liquid or dry material in a mounted bowl.

Villi. Protrusions on the mucous membrance of the small intestine. They absorb end-products of digestion.

Virus. Organism smaller than bacteria that grows in living tissue and may cause disease in plants and animals.

Viscera. The internal organs, especially those of the cavities of the body, as, the heart, liver, and intestines.

Vitamin. A group of unrelated organic substances found in many foods in small amounts. Absence or deficiency of one or more may lead to a deficiency disease, such as scurvy.

Volatile. Tending to evaporate quickly.

Volume. Total cubic inches of a loaf. Bread with 9.5 to 10.4 cubic inches per ounce has correct volume.

Voucher. A paper which serves to bear witness to the truth of something; a receipt.

Waldorf Salad. A salad made with diced apples, celery, nuts, lemon juice, and mayonnaise.

Wash. Liquid brushed on the surface of an unbaked product to give a golden brown color to crust. The liquid may be water, milk, starch solution, thin sirup, or egg.

Water Absorption. The capacity of flour to absorb water, expressed as percentage of water to flour. The water absorption varies with the type of flour and conditions under which the flour was stored.

Water Sterilizing Bag (Lyster Bag). A 36-gallon bag complete with sling, cover, tripod, and faucets, for the purification, storage, and dispensing of water.

Water Stone. A stone for sharpening knives.

Water Tempering and Measuring Device. A device controlled either manually or thermostatically which regulates the temperature and amount of the water flowing into a batch of dough.

Weak Flour. Flour containing gluten lacking in elasticity which will produce small loaves of bread.

Welsh Rarebit. A dish of melted or toasted cheese, milk, flour, butter or other fat, and spices, poured over toasted bread or crackers.

Wet-bulk Thermometer. In measuring humidity, a thermometer the bulk of which is kept moistened.

Wheat Base. Concentrated form of wheat flour which meets stability requirements for oversea use. Used as a substitute for whole wheat flour.

Wheat Bread. A variety bread containing from 40 to 60 percent whole wheat flour. Wheat flour is flour ground from wheat of different types and grades.

Whip. To beat rapidly to increase volume by incorporating air; to beat to a froth. An instrument used by whipping which consists of strong wires held together by a handle.

Whipping Ice Cream. In making ice cream, the process of agitating frozen ice cream to incorporate air in it after a refrigeration unit has been turned off.

White Rye Flour. Rye flour with a dull-white color. As much as 40 percent can be mixed with wheat flour to make bread.

Wing. A term used in meatcutting to refer to rib and plate beef.

Wire Whip. An accessory of the vertical mixing machine, used on light or thin mixtures, such as meringue, cream, or whole eggs.

Worcestershire Sauce. A pungent sauce, originally made in Worcester, England, consisting of soy, vinegar, and many other ingredients.

Worm. The spiral metal part that conducts meat to the grinder plate of a grinder.

Xerophthalmia. A dry, lusterless condition of the eyeball.

Yearling Hens. Fully matured female turkeys about 15 months old, reasonably tender, weighing from 8 to 14 pounds.

Yeast. A microscopic one-celled plant important in bread production because it can ferment a sugar solution, producing carbon dioxide gas and alcohol. Yeast must be in the active or vegetative stage to act as a leavening agent.

Yeast-food Dough. Dough to which mineral yeast food has been added.

Young Dough. Dough which is underfermented.

Young Hens. Female turkeys under 8 months old, from 8 to 14 pounds, with tender meat and soft, pliable, smooth-textured skin.

Young Toms. Male turkeys under 8 months old, from 8 to 24 pounds, with tender meat and soft, pliable, smooth-textured skin.

Zymase. The specific fermenting enzyme in yeast, which converts invert sugar and dextrose or fructose into carbon dioxide and alcohol.

Zymogen. A substance which, by internal change, gives rise to an enzyme.

SECTION II

FRENCH MENU AND CULINARY TERMS

French Term	Pronunciation	Definition
Agneau	ahn-yo	Lamb
Aigre	ay'gr	Sour
Ail	eye	Garlic
A la	ah lah	In the fashion of
A la carte	ah lah cart'	One dish at a time
Allumette	ah-loo-met'	Matchstick potatoes
A la mode	ah-lah-mode'	In a usual fashion
Amandine	ah-maan-deen'	With almonds
Ananas	an-nah-nah'	Pineapple
Apricots	ah-pree-ko'	Apricots
Asperges	ah-spayre'	Asparagus
Aspic	ah-speek'	Decorated jellied piece
Aubergine	oh-bare-zheen'	Eggplant
Au gratin	oh grah-tan'	With cheese; brown; with crust
Au jus	oh-zhue	With natural juices
Au naturel	oh nah-tur-el'	Plain, without cooking; without the addition of other materials
Aux fines herbes	of feen erb'	With fresh herbs
Bagette	bag-et'	Long loaf of bread
Bechamel	bay-shaw-mel'	Cream sauce
Beignet	bayn-yay'	Fritter
Betteraves	bet-rav'	Beets

French Term	Pronunciation	Definition
Beurre	bur	Butter
Bifteck	bif-teck'	Beefsteak
Bisque	beesk	Thick rich soup; fish stew, creamed
Blanc	blawnk	White
Boeuf	buf	Beef
Bouillabaisse	boo-yuh-baze'	Fish stew
Bouillon	boo-yawn'	Broth
Bouquetiere	boo-ket-yer'	With mixed vegetables
Bombe	bohmbuh	Dish of ice cream with liqueur
Bouteille	boo-tie'	Bottle
Brie	bree	Cheese
Brioche	bree-osh'	A sweet dough roll of French origin
Cafe	ka-fay'	Coffee
Cafe au lait	ka-fay' oh lay	Coffee with hot milk
Cafe noir	ka-fay' nwah	Black or after-dinner coffee
Camembert	ka-mem-bair'	Type of cheese
Canard	kah-nahr'	Duck
Canapes	ka-nuh-payz'	Tiny, open sandwiches made with highly flavored mixtures
Carte	kart	Bill of fare
Caviar	kav-ee-ahr	Sturgeon eggs
Champignon	shawn-peen-yawn'	Mushroom

French Term	Pronunciation	Definition
Chantilly	shawn-tee'-yee	With whipped cream
Chapon	shah-pawn	Capon
Chasseur	shan-seur	Hunter style
Chateaubriand	shah-to-bree-yawn'	Thick filet mignon
Chaud	show	Hot
Chocolat	show-ko-la'	Chocolate
Chou	shoo	Cabbage
Chou-fleur	shoo-flure'	Cauliflower
Choux de Bruxelles	shoo-duh-brewzel'	Brussels sprouts
Coeur	kerr	Heart
Compote	kom-pawt'	Stewed fruit; sauce of one kind of fruit, usually apple
Concombre	kawn-kawnbr'	Cucumber
Confiture	kawn-fee-toor'	Jam, preserve
Consomme	kawn-saw-may'	Clear soup
Coquille	ko-kee'	Shell for baking
Cote	kaw	Rib; chop
Creme	krem	Cream
Creme Fouettee	krem-fo-et-tay'	Whipped cream
Crepe	krep	Pancake
Crevette	kruh-vet'	Shrimp
Croquette	kro-ket'	Patty of meat
Crumb	krum	Piece of bread or cake
Cuisinier	kwee-zin-yay	Cook
Dejeuner	da-zhoe-nay	Breakfast; lunch

French Term	Pronunciation	Definition
Diable	dee-a bl	Deviled
Demitasse	demee tass	Half cup
Dinde	dand	Turkey
Du jour	d'zhuhr	Of the day
Ecrevisse	ay-kruh-veese'	Crayfish
Eau	oh	Water
En	uh	In
En bellevue	uh bell-voo'	In aspic jelly
En brochette	ahn-broh-shet	On a skewer
En coquilles	uh ko-kee'	In shells
Entrecote	awn-truh-ko'	Sirloin steak
Entree	awn-tray	Main course
Entremets	awn-truh-meh'	Desserts
Epinard	ay-pee-nahr'	Spinach
Escargots	es-kahr-go'	Snails
Faisan	fay-zawn'	Pheasant
Farce	fahrce	Ground meat
Farci	fahr-see'	Stuffed
Filet	fee-lay'	A fleshy cut of meat or fish, usually without bones
Filet mignon	fee-lay' mee-yawn'	A small round cut of lean beefsteak
Flambe	flawm-bay'	Flamed
Flan	flah	Custard; mold
Florentine, a la	floor-ahn-teen	With spinach

French Term	Pronunciation	Definition
Foie	fwah	Liver
Foie gras	fwah grah	Goose liver
Fondue	fawn-doo	Melted cheese
Frappe	frap-pay'	Fine ice
Fricassee	frick-a-say'	Method of cooking
Forestiere	faw-rest-teeyer'	With mushrooms
Frit	free	Deep fat fried
Froid	frwah	Cold
Fromage	froh-maj'	Cheese
Fume	foo-may'	Smoked
Garnitures	gar-knee-tur'	Garnishes
Gateau	gah-toe'	Cake
Gelee	zhuh-lay'	Jelly
Gigot	zhee-go'	Leg
Glace	glahss	Ice; ice cream
Grenouille	gruh-noo-ee'	Frog
Grille	gree-yay	Broiler
Hareng	ah-rawng'	Herring
Haricot vert	ah-ree-ko' vair	String beans
Hollandaise	ah-lan-days	Sauce made with egg yolk, melted butter, and lemon
Homard	oh-mar'	Lobster
Hors d'oeuvres	ohr-doe'vr	Predinner tidbits
Huitres	weet'ruh	Oysters

French Term	Pronunciation	Definition
Jambon	zhahn-bawn'	Ham
Jardiniere	zhar-dan-yer'	With vegetable
Julienne	zhool-yen'	Thin strips
Jus	zhue	Juice, gravy
Lait	lay	Milk
Laitue	lay-tew'	Lettuce
Langouste	lawn-goost'	Rock lobster; sea crayfish
Lapin	lah-pan'	Rabbit
Legume	lay-goom'	Vegetable
Macedoine	mah-suh-dwahn'	Mixed fruits
Madrilene	mah-dree-lain'	Tomato soup
Maitre d'hotel	maytr doe-tell'	Head of food service
Marrons	mar-ron'	Chestnuts
Meringue	meh-rang'	Beaten egg white
Meuniere	men-yare'	Pan fried and served with brown butter
Mignon	mee-yawn'	Dainty
Mirepoix	mere'eh-pwah	Mixture of onions, carrots, and celery
Mousse	moose	Whipped foam
Mouton	moo-tawn'	Mutton
Navets	nev-et'	Turnips
Noisette	nwah-zet'	Hazelnut
Nouille	noo-ee'	Noodle
Oeuf	euf	Egg

French Term	Pronunciation	Definition
Oeufs poches	uf-paw-shay'	Poached eggs
Omelette	ohm-let'	Mixed egg
Oignon	awn-yawn'	Onion
Pain	pan	Bread
Parfait	pahr-fay'	Ice cream dish
Pate	pah-tay'	Meat paste
Patisserie	pah-tee-suh-ree'	Pastry
Peche	paish	Peach
Petit fours	pe-tee' foor'	Small pastries
Petit pains	pe'tee' pan'	Rolls or small bread in any form
Poire	pwahr	Pear
Pois	Pwah	Peas
Poissons	pwah-sawn'	Fish
Poitrine	pwah-treen	Breast
Pommes	pawn	Apples
Pommes de terre	pawm'duh-tayr'	Potatoes
Potage	poh-tahge'	Soup
Pot Au Feu	pot-dh-fe'	Boiled beef with a variety of vegetables and broth
Poulet	poo-lay'	Chicken
Puree	poo-ray'	Sieved food
Quenelle	kuh-nel'	Dumpling
Ragout	rah-goo'	Stew
Ris	ree	Sweetbread

143

French Term	Pronunciation	Definition
Riz	ree	Rice
Rognon	rawn-yawn'	Kidney
Roti	ro-tee'	Roasted
Roulade	roo-lahd'	Rolled meat
Roux	roo	Sauce foundation - equal parts of flour and fat
Saucission	saw-see-sown'	Sausage
Saumon	saw-mone'	Salmon
Saute	saw-tay'	Pan fried in butter
Sel	sell	Salt
Sole meuniere	sol men-yare'	Fish in sauce
Sorbet	sawr-bay'	Sherbet
Souffle	soo-flay'	Whipped pudding
Tasse	tahce	Cup
Tranche	trawnsh	Slice
Veau	vo	Veal
Vichysoisse	vee-shee-swahz'	Hot or cold potato and leek soup
Viennoise	vee-yen-wahz'	Vienna style, breaded
Vin Rose	veh rhoze'	Rose-colored wine
Vin Rough	veh rhoush'	Red wine
Vinaigrette	vee-nay-gret'	Dressing with oil, vinegar and herbs
Volaille	vo-lie'	Poultry
Vol au vent	vole oh vaan'	Patty shell

PROGRAMED TEXT

144

PREVENTION OF FOOD POISONING

FOOD SERVICE SCHOOL COMPANY
MARINE CORPS SERVICE SUPPORT SCHOOLS
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA
JUNE 1972

9-4

OBJECTIVES

After completing this program, you will be able to

1. define food poisoning.
2. select from a list the two principal types of food poisoning.
3. tell which kind of food poisoning occurs most often.
4. select from a list the kinds of food poisoning caused by bacterial toxin and those caused by bacterial infection.
5. name the six factors that control the growth of bacteria.
6. tell how to prevent food poisoning.
7. tell how dysentery and trichinosis are caused and how they can be prevented.

1. Each year approximately one million persons in the United States are stricken with food poisoning. Some of these illnesses may last only 24 hours; others will cause pain and discomfort to the victim for the rest of his life.

146a

2. Food poisoning can be a serious matter to any Army unit. Even a minor case can disable the unit to the extent that it fails to accomplish its mission.

As a food service supervisor or food handler, you can help to prevent food poisoning by preparing, serving, and handling food properly.

3. What is food poisoning?

Food poisoning is the sudden illness of a substantial number of people who have recently eaten the same specific food.

Food poisoning can always be traced to a ____________________ food.

specific

4. For an illness to be diagnosed food poisoning, a ____________ ____________ of people who have eaten a specific food must become ill about the same time.

149

substantial)
    or   ) number
large   )

5. A family of four could have food poisoning after a picnic; but, if six men from a company became ill after the entire company ate the same food in the messhall, their illness could not be ______________

____________________________.

food poisoning

150

6. An illness of a substantial number of people who have eaten the same food is _____________ ___________________.

153

food poisoning

7. The two types of food poisoning are chemical and biological.

FOOD POISONING

CHEMICAL	BIOLOGICAL

8. There are two types of food poisoning: ____________________ and ____________________. Any case of food poisoning can be classified as one of these two types.

153

chemical, biological

9. Food poisoning caused by bacteria, plants, and animals is biological food poisoning.

Food poisoning caused by insecticides, fungicides, and rodenticides and by the use of equipment that contains poisonous materials is chemical food poisoning.

FOOD POISONING

CHEMICAL	BIOLOGICAL		
	Plants	Animals	Bacteria

156

154

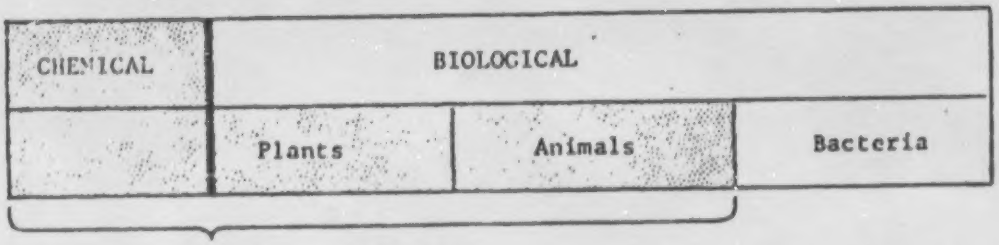
10. If food poisoning is caused by bacteria, animals, and plants, it is called ________________ food poisoning.

157

biological

11. Chemical, plant, and animal food poisoning are the easiest to prevent. They account for less than 5 percent of all cases of food poisoning.

FOOD POISONING


CHEMICAL
BIOLOGICAL
Plants
Animals
Bacteria

Cause less than 5% of all cases of food poisoning.

11

12. If chemicals, plants, and animals cause less than 5 percent of all food poisoning, then ____________________ cause more than 95 percent.

bacteria

13.

FOOD POISONING			
CHEMICAL	BIOLOGICAL		
	Plants	Animals	Bacteria*
antimony cadmium copper lead zinc insecticides fungicides rodenticides	some mushrooms rhubarb leaves water hemlock	some shellfish some tropical fish trichina	Staphylococcus C. botulinum Salmonella Streptococcus C. perfringens

* Staphylococcus food poisoning is usually called staph food poisoning. Streptococcus food poisoning is usually called strep food poisoning. This is the organism that causes strep throat. The terms "staph" and "strep" are used throughout this text.

14. Certain metallic chemicals, if used in the manufacture of mess equipment, will cause food poisoning. Some of these are copper, lead, antimony, zinc, and cadmium.

15. Army Regulation 40-5 states that equipment which comes into contact with food will not be made of or plated with materials that contain cadmium, lead, zinc, or other poisonous material. However, galvanized metal may be used for storage of dry food.

The regulation also specifies that acid foods or beverages will not be stored, prepared, or served in zinc-galvanized containers.

16. No standard Army messing equipment will contain a poisonous material.

Galvanized metal containers may be used for storing __________ __________________ only.

161

dry food

17. The way to prevent food poisoning from metallic chemicals is to use ______________ Army equipment in the preparation and storage of food.

standard

18. Chemical food poisonings have increased with the general use of insecticides, fungicides, and rodenticides. These poisons are to be used only in the way prescribed by Army regulations (AR 420-76).

19. Poisons cannot be stored in messing facilities. Poisons (insecticides, rodenticides, and the like) must be stored and used as prescribed by Army ____________________.

regulations

20. Two rules to remember in preventing chemical food poisoning:

Use only standard Army-procured mess equipment.

Follow Army ________________________ in the use of insecticides and rodenticides.

165

regulations

21. The three types of biological food poisoning are plant, animal, and bacterial.

Food poisoning from plants is particularly easy to avoid. No poisonous plants are procured for food; so it is necessary only to stay within supply channels and to use approved food sources.

166

22. If you use only plants obtained from approved sources or supply channels, you will not have food poisoning due to ____________________.

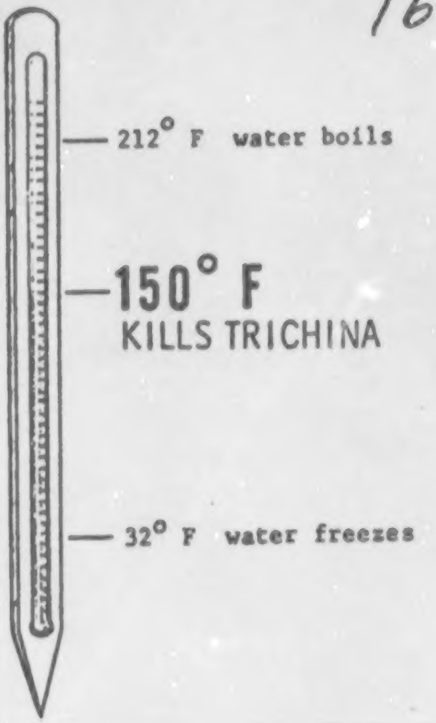
plants

23. Using foods from approved supply sources is also important in preventing animal food poisoning. The Army carefully tests and inspects foods as they are purchased to make certain they can be safely eaten. It is unlikely, for example, that you would get animal food poisoning from fish or shellfish obtained from Army sources. (Remember, however, that these items and others can become contaminated with bacteria if not properly handled. They can then cause bacterial food poisoning.)

168

24. The trichina, a worm so small that it can be seen only with a microscope, causes trichinosis, another type of animal food poisoning. A person may get trichinosis by eating trichina-inrested pork that has been undercooked. Cooking pork to an internal temperature of 150° F and above will kill the trichina.

25. To prevent trichinosis, Army regulations require that pork be cooked to an internal temperature of 150° F.


212° F water boils
150° F
KILLS TRICHINA
32° F water freezes

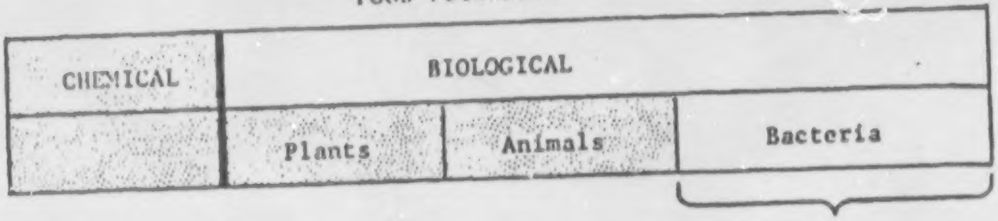
26. Pork must be cooked to an internal temperature of ________° F 170

to prevent ____________________.

150, trichinosis

27. The three causes of biological food poisoning are animals, plants, and bacteria. However, bacteria cause 95 percent of all cases of food poisoning.

FOOD POISONING


CHEMICAL
BIOLOGICAL
Plants
Animals
Bacteria

Cause 95% of all cases of food poisoning.

172

28. Ninety-five percent of all cases of food poisoning are caused by ____________________.

195

bacteria

29. Before studying the specific bacteria that cause food poisoning, you need to know what conditions promote the growth of bacteria. You can prevent the growth of bacteria if you understand how they grow and how you can control their environment.

174

30. The growth of bacteria depends on six important factors. Use the memory word FOAMTT to help you remember these factors:

FOOD
OXYGEN
ACIDITY
MOISTURE
TEMPERATURE
TIME

187

175

31. The first letter of the word FOAMTT stands for food. Bacteria, like all other living organisms, must have food. Many bacteria will feed upon the food of man and will grow freely in it.

FOOD
O
A
M
T
T

32. One reason that man is endangered by bacteria is that both man and bacteria live on the same ____________________. 176

food

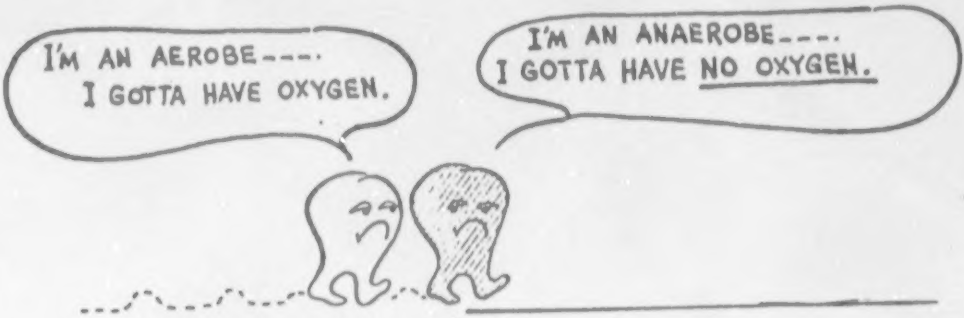
33. The first important factor of bacterial growth is ___________.

178

34. Another factor in bacterial growth is oxygen, or air. If you know the oxygen needs of the types of bacteria and can control the environment of bacteria, you can prevent bacterial food poisoning more easily.

Some bacteria live only in the presence of oxygen: Aerobes.

Some bacteria live only in the absence of oxygen: Anaerobes.


I'M AN AEROBE---.
I GOTTA HAVE OXYGEN.
I'M AN ANAEROBE---.
I GOTTA HAVE NO OXYGEN.

34 ____________________

35. Two of the six factors (FOAMTT) that influence the growth of bacteria are food and oxygen. Bacteria that live only in the presence of oxygen are called ______________________.
(aerobes - anaerobes)

180

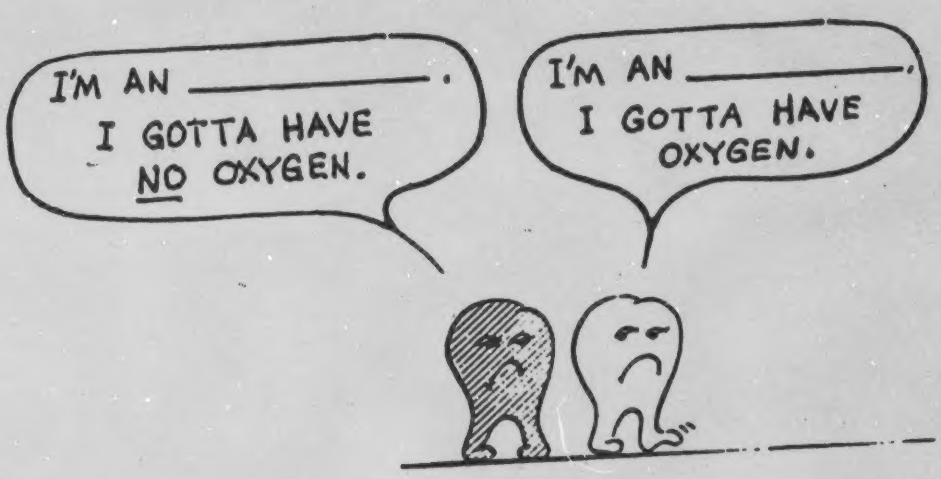
aerobes

36. Aerobes are bacteria that live only in the ______________ of oxygen.

181

presence

37.

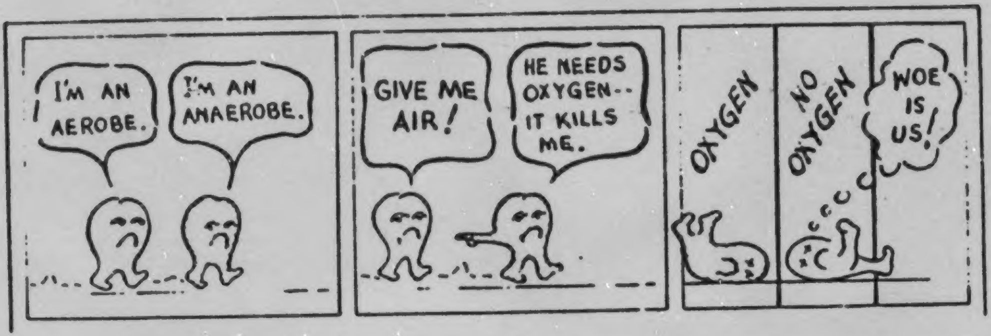

I'M AN ________. I GOTTA HAVE NO OXYGEN.
I'M AN ________. I GOTTA HAVE OXYGEN.

37

anaerobe, aerobe

38. Bacteria that live only in the absence of oxygen are called anaerobes.

39. Aerobes live only in the presence of oxygen, but anaerobes live only in the absence of oxygen.


I'M AN AEROBE.
I'M AN ANAEROBE.
GIVE ME AIR!
HE NEEDS OXYGEN-- IT KILLS ME.
OXYGEN
NO OXYGEN
WOE IS US!

40. Because some bacteria can live where there is no oxygen, they can live in foods in sealed containers (for example, cans, bottles, and plastic bags or pouches). When they do, they contaminate the foods.

41. Two of the six factors that control the growth of bacteria are food and ________________. The next factor you will study is acidity. Most bacteria grow best in materials that are neither strongly acid nor strongly alkaline.

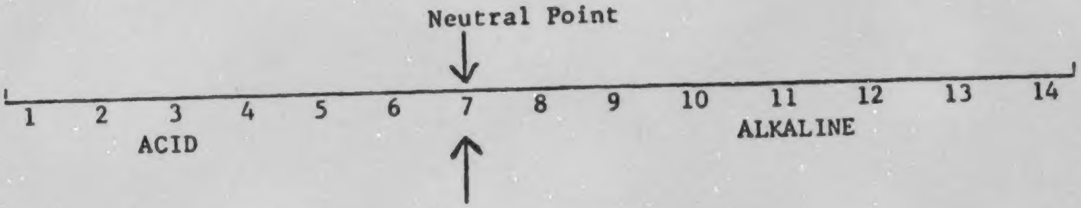
FOOD
OXYGEN
ACIDITY
M
T
T

41

oxygen

42. The amount of acid or alkalinity contained in a material is measured on the pH scale. Most bacteria grow in the middle of the pH scale between pH 6 and pH 8.

pH scale


Neutral Point
1
2
3
4
5
6
7
8
9
10
11
12
13
14
ACID
ALKALINE

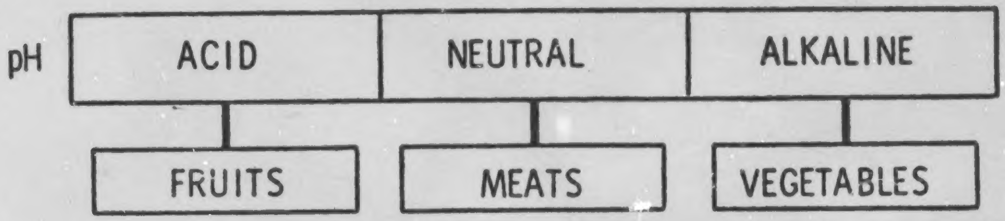
187

43. Many of the foods of man are neither highly acidic nor highly alkaline. Meats, for example, would fall in the middle of the pH scale, from pH 6 to pH 8. Most fruits contain a great deal of acid; most vegetables are alkaline. You can usually tell an acid food by its tart taste.

188

44. Some bacteria grow in highly acidic materials; others grow in highly alkaline materials. However, most bacteria grow best near the ________________________ of the ________ scale, from pH 6 to pH 8.

45. Here's where the classes of foods usually fall on the pH scale.


pH
ACID
NEUTRAL
ALKALINE
FRUITS
MEATS
VEGETABLES

See if you can tell where each of the following foods would fall. In the blanks provided, write A beside an acid food, N beside a neutral, and Al beside an alkaline.

____ 1. grapefruit juice

____ 2. squash

____ 3. apples

____ 4. turkey

____ 5. peas

____ 6. steak

1. A   4. N
2. Al   5. Al
3. A   6. N

46. Since bacteria grow best in materials that are neither strongly acidic nor strongly alkaline, you can see that the food of man may be a natural breeding place for harmful bacteria.

47. Three of the six factors that influence bacterial growth are

______________, ___________________________, and ______________.

food, oxygen, and acidity

48. A fourth factor in bacterial growth is moisture. Because bacteria must absorb their food through their cell walls, they must have ______________________ to live and grow.

Food
Oxygen
Acidity
Moisture
T
T

moisture

49. Moisture is so important that bacteria will not grow in a material in which the moisture content is lower than 15 percent.

If the ____________________ content of a material is less than 15 percent, bacteria will not grow in it.

moisture

50. The first four factors that influence bacterial growth are

______________, ______________, ______________,

and ______________.

F
O
A
M
T
T

195

51. Another factor in bacterial growth is temperature.

For bacteria to grow, they must have a suitable temperature.

Therefore. bacterial growth can be controlled by controlling

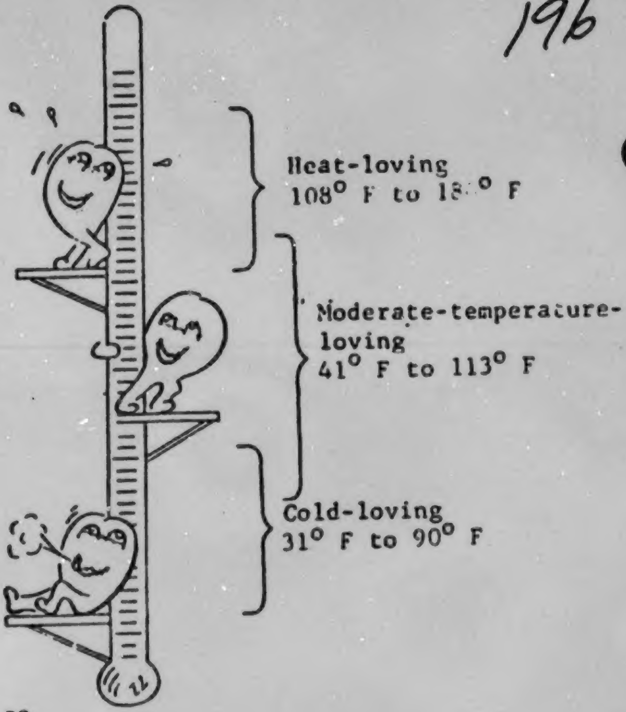
the ______________________.

Food
Oxygen
Acidity
Moisture
Temperature
T

51

temperature

52. Bacteria may be divided into three groups with respect to temperature. The temperatures at which these bacteria grow best are shown on this thermometer.


Heat-loving
108° F to 18[illegible]° F
Moderate-temperature-loving
41° F to 113° F
Cold-loving
31° F to 90° F

52

temperature-loving or ______________-loving.

heat, moderate, cold

54. In addition to the three types of bacteria you have studied, there are others called heat-withstanding bacteria.

Heat-withstanding bacteria are highly heat-resistant; their spores (survival forms) can withstand boiling.

199

55. So far, you have learned five of the six factors that affect the growth of bacteria. They are

F____________________

O____________________

A____________________

M____________________

T____________________

T____________________

56. Time also is an important influence on the growth of bacteria.

Given enough time, most bacteria can adjust to different foods, to an environment with or without oxygen, to varying degrees of acidity and moisture, and to different temperatures.

Food
Oxygen
Acidity
Moisture
Temperature
Time

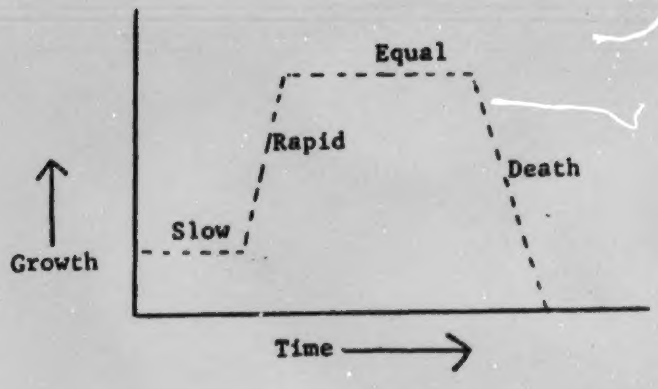
57. The time required for the growth and death of bacteria may be divided into four phases:

Lag (slow) phase

Rapid-growth phase

Equal phase

Death phase



57

202

58. The slow phase occurs when bacteria are adjusting to a new environment. The growth rate during this period is very slow, because bacteria require time to make an adjustment to a new environment.

59. It takes ____________________ for bacteria to adjust to a new environment. Then they begin to multiply rapidly. In this period of rapid growth, the number of bacteria increases tenfold for every unit of time.

time

60. Bacteria require time to adjust to a new environment before they enter a period of extremely ________________ growth.

Growth gradually levels off and remains constant for a few hours. During this time, growth of new bacteria equals death of old bacteria (the equal phase). Then the mass of bacteria begins competing for food, and there is more bacterial waste than food. Gradually, the bacteria die (death phase).

rapid

61. The most important thing to remember about the time required for bacterial growth is that most bacteria can adjust to a new environment in about 4 hours.

Prepared food cannot be removed from the refrigerator and left at room temperature for more than ________ hours, because harmful bacteria will begin to multiply in it.

12
1
2
3
4
5
6
7
8
9
10
11

206

62. Most frequently, food poisoning is caused by bacteria, so that preventing food poisoning depends largely on preventing the growth of harmful bacteria. Six factors that control the growth of bacteria are

F____________________

O____________________

A____________________

M____________________

T____________________

T____________________

62

63. Bacteria cause illness in two ways:

By producing in the food toxins, or poisons, which when eaten cause violent stomach reactions.

By invading the body tissues and multiplying, producing harmful activity known as infection.

64. Toxins, or poisons produced by bacteria, may be present in food before it is eaten. Food poisoning can be caused by toxins.

The harmful activity of bacteria as they invade the body tissues and multiply is ______________________.

209

infection

65. Infection is the harmful activity of ____________________ as they multiply in the body tissues. The poisonous by-products of bacteria, or ____________________, also cause illness.

bacteria, toxins

66. The toxins of some bacteria (staph food poisoning, for example) are heat-stable; that is, they are not readily destroyed by heat.

Even though leftover food is boiled before it is served, the ______________ will still be present to cause food poisoning.

toxin

67. Staph food poisoning, botulism, and perfringens food poisoning are caused by bacterial toxins.

68. Although both staph food poisoning and botulism are caused by bacterial ________________, they are not similar in other respects.

Staph food poisoning produces a toxin that ______________ (is, is not) easily destroyed by heat.

The botulism toxin ______________ (can be, cannot be) destroyed by heat.

2/3

toxins
is not, can be

69. Staph food poisoning produces illness for about 48 hours.

Botulism does not occur frequently in the United States; however, it is fatal to more than half of its victims.

70. Most cases of food poisoning are caused by the ____________ that are produced by bacteria.

toxins

71. To prevent staph food poisoning, you need to know the conditions that promote the growth of the bacteria which cause it.

72. These bacteria like moderate temperatures, and they require oxygen for proper growth and development. They grow and produce their poisonous byproducts (toxins) best in materials that are neither highly acidic nor highly basic.

73. The bacteria that cause staph food poisoning grow in

__________________ temperatures in the presence of oxygen. Their

ideal environment is the neutral area of the pH scale.

moderate

74. Boiling at 212° F for 30 minutes destroys the organism responsible for common food poisoning. However, the toxin produced by these organisms is very difficult to destroy. For this reason, the toxin is described as heat-stable.

Although the organisms themselves are destroyed, the ________________ produced can still cause illness.

toxin

75. Because of the danger from toxins, Army regulations prescribe that certain foods may not be retained as leftovers.

The usual heating of leftovers ____________________ destroy
(will - will not)
toxin produced in staph food poisoning.

will not

76. Bacteria responsible for staph food poisoning seem to prefer ready-to-serve foods--custards and cream-filled pastries, hams, cakes, mayonnaise, chicken gravy, dairy products, and sausage.

But it is pointless for you to spend time learning long lists of foods in which the species will grow. Bacteria are highly adaptive. Given enough time, they can adjust to a new environment and to foods in which they don't usually grow.

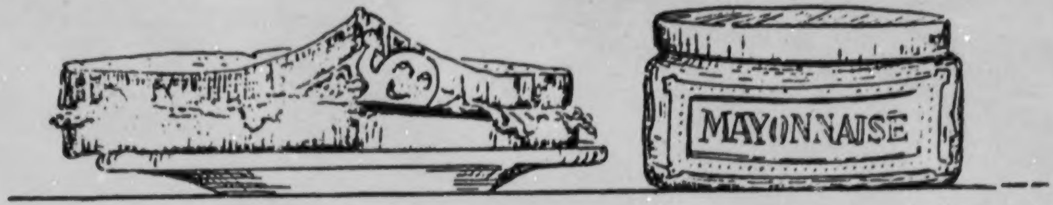
77. Refrigeration greatly reduces the possibility of growth of bacteria.

Experiments have shown that cultures of staphylococcus organisms refrigerated at 38° to 44° F required 4 weeks to produce toxins. Identical cultures kept at room temperature produced toxins in a matter of hours.

222

78. All foods that will grow bacteria must be kept under ____________________. Some of these foods are pastry-filled bakery products, sandwiches, and cakes.

Sandwiches are often responsible for food poisoning. For this reason, sandwich fillers that readily support bacterial growth must not be used for box lunches; and prepared sandwiches must not be left at room temperature for more than 4 hours.



235

refrigeration

79. Certain types of sandwich fillers are the ideal breeding places of harmful bacteria.

Prepared sandwiches must not be left at room temperature for more than __________ hours.

80. Foods must be refrigerated properly so that they will cool rapidly. If a 10-gallon pot full of hot stew is placed in the refrigerator, it will take hours for the internal temperature of the stew to reach a temperature of 34° to 44° F. To refrigerate foods properly, place them in shallow or small containers.

225

81. Good personal hygiene is essential in preventing contamination by bacteria.

Bacteria are found on the skin; in boils, pimples, nasal discharges, and saliva; and in the air. In fact, each sneeze and cough discharges these organisms. If these bacteria contaminate food and produce toxins, food poisoning will result.

82. The fact that bacteria may be found in any infection has an important bearing on food handling.

If you were a supervisor and a cook came to work with sores on his hands, what should you do? ______________________________

____

____

An answer similar to "Keep him from handling food" or "Send him on sick call" is satisfactory.

83. If a person with an infection handles food, he may contaminate it with ________________________.

bacteria

228

84. A case of staph food poisoning was traced to meat and gravy prepared by a cook whose fingers had become infected after having been burned.

Persons with ____________________ must not be allowed to handle foods.

infections or burns

85. The more food is handled, the greater the possibility of contamination.

One wav to keep food from being contaminated is to keep food

____________________________ to a minimum.

handling

86. Some rules for the prevention of staph food poisoning are as follows:

--Keep food handling to a ________________________.

--Keep all foods that will grow bacteria under ___________________

--See that persons who handle food are free of infections and that they practice good personal hygiene.

minimum, refrigeration

87. Botulism, like staph food poisoning, is caused by toxins, which are produced by the organism Clostridium botulinum.

88. Botulism is most often fatal.

NOBODY FOOLS AROUND WITH C. BOTULINUM!

89. The organism which is responsible for botulism likes moderate temperatures and lives in the absence of oxygen; that is, it is an anaerobe.

90. When an organism is an anaerobe, it must have an environment which has no ______________.

oxygen

91 The botulism organism grows without oxygen, in containers of processed food that are not commercially sterilized.

92. Botulism bacteria grow without ____________________ in containers of processed foods that have not been commercially ____________________

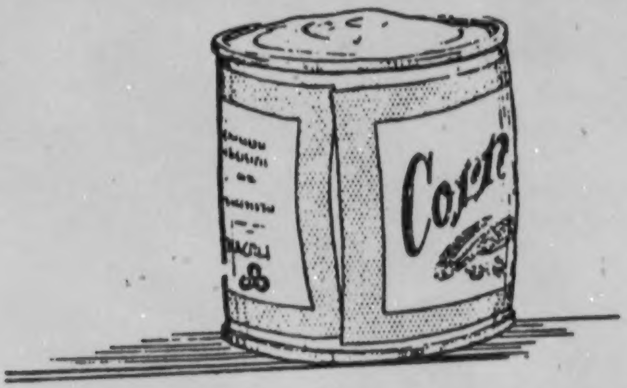
oxygen, sterilized

93. The toxin produced by these bacteria is one of the most powerful poisons known to man. Only one milligram of the toxin ($\frac{1}{28,000}$ of an ounce) is needed to cause death to 8,000 people.

In two separate cases, death was caused by testing one snap bean.

94. Temperatures of 212° F and above may destroy the toxin that causes botulism. However, if it is suspected that a food might cause botulism, the food must always be destroyed.

95. The presence of this toxin has been indicated by swollen containers of processed food, discoloration of food, and abnormal or strong odor. Therefore, no swollen containers of food will be opened and the food served unless the surgeon or veterinarian so directs.

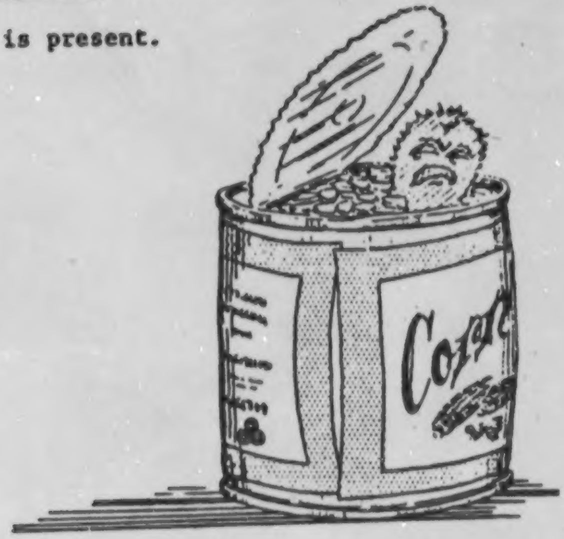


95

96. Cans of food which show swelling or leaking ______________ be
(can - cannot)
served without the approval of the surgeon or the veterinarian.

cannot

97. Food having unusual or off-odor or unusual or off-color must not be served or even tasted! Swollen containers may indicate that the toxin of the botulism bacteria is present.



97

98. If you open a can of corn and find that it has an unusual odor and color, do not ________________ it or serve it.

taste

99. The presence of toxin from the botulism organism may be indicated in processed food by off-________________ and off-_____________________ or by ____________________ containers.

odor, color, swollen

100. You may not be able to tell by the color, odor, or taste of a food that the food is contaminated.

101. Some rules for the prevention of botulism are as follows:

--Do not serve or taste foods having off-________________ or off-____________________.

--Do not serve or taste foods from ____________________ or leaking containers.

color, odor, swollen

102. Some facts to remember about the botulism toxin are as follows:

--It is produced in containers of processed food that have not been commercially ______________________________.

--It is a deadly ______________________________ sterilized, poison

103. Another toxin-producing bacterium that is more frequently being detected as a cause of food poisoning is the Clostridium perfringens (usually written C. perfringens). It is found in soil and in raw meat and is highly heat-resistant.

104. It is ______________ to kill C. perfringes with heat.
easy, difficult

249

difficult

105. Although the organism that causes perfringens poisoning is closely related to the one that causes botulism, perfringens is not fatal.

106. Perfringens poisoning develops in about 15 hours and lasts only a day or less than a day. The symptoms are abdominal pain, diarrhea, and chills. Not often does the victim experience nausea, vomiting, or fever.

If you heard that a patient had suddenly died of food poisoning, would you suspect perfringens or botulism? ______________________

botulism

107. Meats that have not been carefully prepared are most often the cause of perfringens food poisoning. Meat pies, boned rolled beef roast, pork, turkey, and fish paste have all been incriminated. One outbreak of 2,000 cases was traced to stuffed turkeys.

Suppose you ate these foods for dinner: rolled beef roast cooked rare, creamed onions, carrots, and apple pie. You later were ill of food poisoning, which the doctor diagnosed as perfringens. Which food should first be examined for wholesomeness? ____________________

the roast beef

108. These are the conditions that increase the hazard of perfringens food poisoning:

- --Improper processing of meats.
- --Overhandling.
- --Failure to refrigerate meats.
- --Exposure of meat to air.

253

109. To control C. perfringens, you must observe the following rules:

--Serve meat dishes as soon as they are cooked, or cool them rapidly to 40 to 45° F.

--When reheating foods, reheat rapidly to 145° F.

--Cook large cuts of meat thoroughly. (Use a meat thermometer to make sure meat reaches required temperature.)

--Divide stews and similar dishes into small lots for cooking and refrigeration.

110. See if you can answer these questions:

a. Why should you divide stew into small lots for cooking or refrigerating? ______________________________

____

____

b. Since C. perfringens are most often found in meats, where on the pH scale do they grow? ______________________________

____

111. Answers to frame 110:

a. The food will heat or cool much more quickly, and the bacteria will not get a chance to grow. (or similar statement)

b. In the middle, or the netural area, of the pH scale.

112. You have studied three types of food poisoning that are caused by bacterial toxins:

Staph food poisoning
Botulism
Perfringens

Now you will study two types of food poisoning that are caused by bacterial infection:

Salmonella food poisoning
Strep food poisoning

113. Some bacteria produce food poisoning by causing infections. These may be the Salmonella bacteria. Many animals are carriers of Salmonella.

114. Salmonella are moderate-temperature-loving aerobes that must have a pH above 6 for growth.

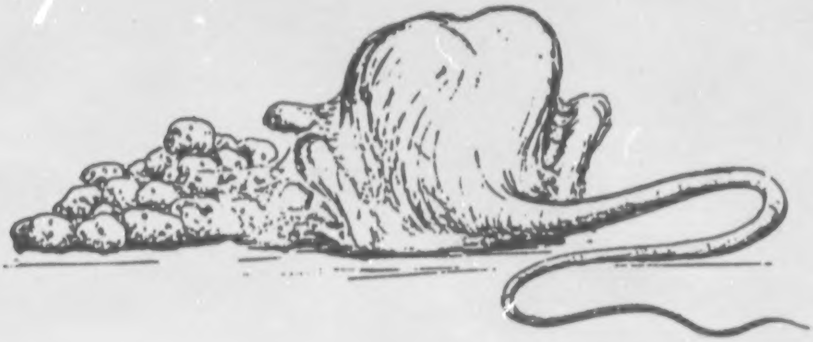
They grow best in materials that are neither highly acid nor highly basic; for example: poultry, salads, meats, and egg products.

115. Salmonella need _________________ temperature. They live in an environment of ___________________________.

moderate, oxygen

116. There are many Salmonella organisms, and most of them will cause illness in man.

117. Salmonella bacteria are common among cattle, swine, chickens, turkeys, dogs, cats, rodents, and man. Any one of these can be a carrier of Salmonella without becoming ill.



118. Many of the animals that are known to carry Salmonella are used for food. However, Salmonella poisoning has been greatly reduced as a result of the U.S. Government's inspection of animals before slaughter and inspection of the carcasses.

Most of the other preventive measures are managed or controlled by mess personnel.

119. One way to prevent Salmonella poisoning is to cook foods thoroughly.

120. Uncooked foods or foods prepared and contaminated by food handlers may be responsible for Salmonella food poisoning.

To prevent this kind of poisoning, cook foods ______________.

thoroughly

121. Salmonella food poisoning has often been referred to as a carrier illness; that is, it is spread by carriers of the bacteria. Any person who is a carrier must not be allowed to handle food.

What kind of examination do you think a person should have to determine whether he is a disease carrier?

____

An answer like "medical examination" is satisfactory.

122. A food handler's examination is the type of medical examination given to determine whether a person who will handle food has a contagious disease.

267

123. Food handlers may be carriers of Salmonella. The type of examination given to screen out disease carriers is the ________________ ________________________ examination.

food handler's

268

124. Proper sanitation is essential in preventing food poisoning. Unclean personal habits, for example, failure to wash the hands after a visit to a restroom, are one way to contaminate foods.

Practice sanitation and good personal hygiene.

125. Good personal hygiene and proper ____________________ are important in the prevention of all food poisoning.

sanitation

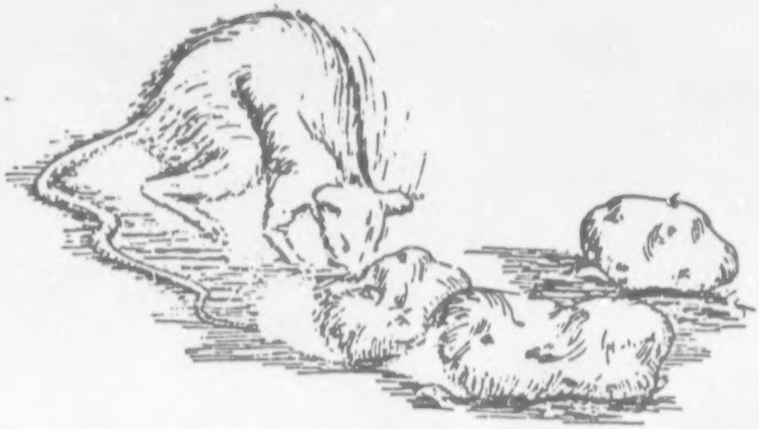
126. Keeping foods under refrigeration prevents the growth of Salmonella.

127. To prevent the growth of the Salmonella in foods, keep the foods under ________________________.

refrigeration

272

128. Rodents are well-known carriers of Salmonella. Foods must be protected from these carriers.



128

129. In your assignment in food service, you do not act as insect and rodent exterminator. You must report the presence of rodents and insects to the Post Engineer or the field sanitation team, depending on your situation. All large-scale insect and rodent problems are handled by the Post Engineer or the field sanitation team.

130. Effective control and extermination of ____________________ and ____________________ are very important, because these vermin are known to be carriers of Salmonella.

The ______________ ____________________ or the field sanitation team is responsible for large-scale extermination problems.

insects and rodents
Post Engineer

131. There are several practices that are effective in preventing Salmonella food poisoning.

--Keep foods under ________________________.

--Cook foods ________________________.

--Require food handlers to have a _______________ _______________ examination.

--Practice sanitation and good personal hygiene.

--Make certain that insects and _________________ are controlled.

refrigeration, thoroughly, food handler's, rodents

132. Like Salmonella poisoning, strep food poisoning is caused by bacterial infection. You will recall that the strep bacteria are responsible for strep throat.

133. Strep food poisoning and Salmonella food poisoning are caused by bacterial ____________________. Infection is the harmful activity of bacteria as they multiply in the body tissues.

infection

134.

CAUSED BY BACTERIAL INFECTION	CAUSED BY BACTERIAL TOXINS
Strep food poisoning	Staph food poisoning
Salmonella food poisoning	Botulism
	Perfringens

135. The strep organisms are aerobes.

They like moderate temperature, and they grow well in an environment having oxygen.

280

136. Strep grow best in ______________________ temperatures. They also grow best in an environment of ___________________.

The Strep organisms, which have a pH requirement of less than 9.5, will not grow in material that is highly ______________________.

moderate, oxygen, basic

137. Staph food poisoning is caused by bacterial toxins, but strep food poisoning is caused by bacterial ________________.

Strep food poisoning is the least severe of the five food poisonings that you have studied. It lasts only 24 hours.

infection

138. Some of the contaminated foods that have caused strep food poisoning are meat and poultry dressings, cheese, cream pies, croquettes, fried eggs, and meats. These aren't the only foods that could be contaminated with strep; so it's not necessary for you to memorize this list of foods.

139. The rules for the prevention of strep food poisoning begin with "Cook Foods Thoroughly." Sufficiently high temperatures will destroy strep organisms.

284

140. To prevent strep food poisoning, cook foods ________________.

"Refrigerate all foods" is also an important rule for the prevention of this type of food poisoning.

thoroughly

141. The growth of the bacteria that cause strep food poisoning can be controlled by keeping foods under ________________________________.

refrigeration

286

142. Some of the other rules for the prevention of strep food poisoning are similar to rules you learned earlier:

Avoid overhandling food, because the more the food is

_________________________, the greater the risk of contamination.

Practice proper sanitation and good personal hygiene.

handled

143. Strep food poisoning is caused by bacterial ____________________.

Prevention of this illness involves

--practicing __________________________ and personal hygiene.

--keeping foods under ________________________.

--cooking foods ________________________.

--keeping foods from being over ____________________.

infection, sanitation, refrigeration, thoroughly, handled

144.

Staph food poisoning) Botulism) Perfringens)	Food poisoning caused by toxins
Strep food poisoning) Salmonella food poisoning)	Food poisonings caused by bacterial infections
DYSENTERY:	A food-borne illness, not a food poisoning

145. Dysentery is a food-borne illness, not a food poisoning. A symptom of dysentery is diarrhea.

290

146. In many parts of the world, dysentery is more prevalent than the common cold. Usually this is true of countries that use night soil (human feces) for fertilizer. Surface water, man, unsterilized utensils, cockroaches, flies, and rodents act as carriers and contaminate food.

147. A messing facility that observes proper sanitary procedures will prevent dysentery from carriers, unsterilized utensils, insects, rodents, and locally procured foods that are eaten fresh.

Notice, however, that water and utensils used by the individual soldier were not included as a responsibility of the messing facility.

148. One of the primary sources of dysentery among U.S. troops is improperly cleaned (or dirty) messkits.

Other sources are unapproved water supply and contaminated uncooked fruits and vegetables.

149. Sources of dysentery among U.S. troops are ____________________ ____________________ messkits, unapproved water supply, uncooked fruits and vegetables.

improperly cleaned, or dirty

150. The sources of dysentery are ____________________ fruits and vegetables, ________________________ water supply, and unsterilized ______________________________.

contaminated or uncooked, unapproved, messkits

151. Each soldier is responsible for his own messkit, but the field mess furnishes the water and facilities for cleaning it after use.

152. Regulations require that in a field messing situation the two messkit rinse waters be kept boiling while in use.

153. The way to sterilize messkits is to keep the water ____________ in the two rinses.

boiling

154. In the prevention of dysentery, it is important that messkits be ________________________________.

properly cleaned

155. Another method of preventing dysentery is to use only approved water--both for drinking and for washing.

156. In an emergency--even in a combat situation--you will be given disinfectant tablets with which to make water acceptable for use.

157. In an emergency, ____________________ ________________

are used to make water acceptable for use.

158. When disinfectant tablets have been added to water, the water becomes approved for use. However, a more desirable situation is for the Engineers to provide water which has been approved by the medical authorities.

159. Fresh fruits and vegetables grown in areas where dysentery is prevalent must not be eaten raw except on the approval of the surgeon.

160. Raw vegetables or fruits from areas where dysentery is prevalent may be eaten only if they are peeled, thoroughly washed in water from an approved source, immersed in water at 160° F for 1 minute, or immersed in a prescribed chlorine solution for 30 minutes (AR 40-5).

161. In areas of the world where dysentery is prevalent, eating raw fruits or vegetables can be a health hazard. These fruits and vegetables must be cleaned as prescribed in Army regulations before they can be eaten.

162. Raw fruits and vegetables grown in parts of the world where dysentery is common can be eaten only after they have been cleaned. The type of cleaning required is specified in Army ________________________.

regulations

163. In the frames that follow, you will briefly review some of the important points of this text. If you have any trouble remembering the answers, return to the appropriate portions of the text and review the material until you understand it thoroughly.

164. Food poisoning is the sudden ____________________ of a ________________ ________ number of people who have recently eaten a specific food. (Frames 3-6.)

The two principal types of food poisoning are ________________ and ________________ __________. (Frames 7-9.)

illness, substantial, chemical, biological

165. Plants, animals, and ______________________ are the three causes of biological food poisoning. (Frames 9, 10.) Of these three, ________________________ cause 95 percent of all cases of food poisoning. (Frames 27, 28.)

Trichinosis is a form of biological food poisoning that comes from eating ____________________ that has not been fully cooked. If the meat is cooked to an internal temperature of _________° F, the trichina will be killed. (Frames 24-26.)

bacteria, bacteria, pork, 150

166. The growth of bacteria depends on six important factors (FOAMTT):

_____________________, ______________________, ____________________,

________________________, ________________________________, and

_______________________. (Frames 30-62.)

. Most bacteria can adjust to a new environment (to room temperature, for example) in about __________ hours. (Frames 58-61.) Foods that readily grow bacteria must be kept under _____________________. (Frames 77-80.)

Food, Oxygen, Acid, Moisture, Temperature, Time, 4, refrigeration

167. Bacteria can cause illness by invading the body tissues and multiplying. This harmful activity is known as ____________________. (Frame 63.)

Bacteria can also cause illness through the production of ____________________. (Frame 63.)

infection, toxins

168. Three types of biological food poisoning caused by bacterial toxins are ________________ food poisoning, ________________, and ________________. (Frame 112.)

Two types of biological food poisoning caused by bacterial infection are ________________ food poisoning and ________________ food poisoning. (Frame 112.)

staph, botulism, perfringens, strep, salmonella

169. The toxin produced by the organism causing staph food poisoning is ____________________________ (not readily destroyed by heat).

(Frame 74.)

heat-stable

170. The most deadly food poisoning is caused by toxin and is known as ______________________________. (Frame 88.)

botulism

171. Some of the practices that will prevent salmonella food poisoning are as follows:

--Require ______ ______________ examination.

--Keep foods under ________________.

--Control insects and ______________.

--Cook foods _____________.

--Practice proper ________________ and personal hygiene.

(Frames 119-131.)

food handler's, refrigeration, rodents, thoroughly, sanitation

316

172. Some of the practices that will prevent strep food poisoning are:

Keep ______________ ____________________ to a minimum.

Cook foods ____________________.

Keep foods under ____________________.

Practice proper __________________.

(Frames 139-143.)

food handling, thoroughly, refrigeration, sanitation

173. The toxin that causes botulism is produced in containers of processed foods that have not been commercially ______________________. Food from leaking or ________________ containers or food that has an off-color or off-odor may contain the botulism toxin. (Frames 91-95.)

sterilized, swollen

174. The most frequent source of ________________________ food poisoning is improperly prepared meat.

The best way to control it is to serve meat dishes as soon as they are cooked or to ____.

perfringens, cool them rapidly

175. The sources of dysentery are improperly cleaned ______________, unapproved ________________ supply, and uncooked ________________ and vegetables. (Frame 150.)

Answer to Frame 175

messkits, water, fruits

PEPPER
SEA
Salad Mustard

Spices

9-4

TRAINING AIDS

TRAINING AID

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1. REFERENCES

a. "Spices," published by American Spice Trade Association Inc., 1956.

b. "Spices Ground and Whole," Federal Specification EE-S-631.

c. "The Structure and Composition of Foods," by Andrew L. Winton and Kate Barber Winter, Vol. IV, published by John Wiley and Sons, NY, 1939.

d. "Elements of Food Engineering," Vol. 1, by Milton E. Parker, Reinhold Publishing Corp., 1952.

e. "Flavors, Beverages and Condiments," Vol. IX, published by QM Food and Container Institute for the Armed Forces, Chicago, Illinois, 1946.

2. PURPOSE AND SCOPE

To provide useful background information and guidance to Government personnel performing inspection on spices.

3. HISTORICAL

The use of spices can be traced back to prehistoric times. They were used not only in foods, but in medicines and as components of perfumes and even as a means of barter. They were of great value and as precious as gold and jewels. Asiatics used spices long before Marco Polo introduced them to Europe. Meats were preserved by wrapping them in aromatic leaves and during the Crusades, the Christian forces carried hot dogs or sausages preserved with spices. Today spices are used throughout the world to improve the flavor and in certain instances the keeping quality of foods. The fact that well-spiced food is more easily digested than that which is insipid accounts for the popularity of spices in the past and present times. Some food seasonings are essentially the same today as they were centuries ago and people often have the idea that the world of spices has remained unchanged. Nothing is further from the truth. Of the products described later in this Training Aid, approximately a third had not been developed 100 years ago; actually several have come into being since World War II.

4. DEFINITIONS

The definition of spices today has become mostly a matter of usage.

a. True Spices are parts of certain aromatic plants which when properly used in conjunction with foods render them more palatable and satisfying, by stimulating the production of gastric juices, thereby aiding digestion. These plants usually grow in the tropic and temperate zones, and the parts of the plant used as a spice may consist of the leaves, roots, bark, stems buds, seeds, or fruit. The term spices includes:

(1) Herbs. Usually leaves and stems of plants that grow in the temperate zones (bay leaves, marjoram, oregano).

(2) Seeds. Seeds and sometimes the small fruit of herb plants which grow in both the tropical and temperate zones (anise, caraway, cardamon, poppy, and coriander).

b. Miscellaneous Dry Seasoning Products include:

(1) Vegetable seasoning - Onions, garlic, shallots, chives, and the like.

(2) Seasoning salts - Mixtures of table salt with a vegetable seasoning, such as garlic, onions, or celery.

(3) Blends - Dry mixtures of spices and herbs for use in special products, such as pumpkin pie, poultry, sauces, and other food preparations. These include curry and chili powders.

c. Condiments are frequently described as food adjuncts or food accessories. They are usually liquid or semi-liquid mixtures of spices and other ingredients, such as prepared mustard, catsup, vinegar and chili sauce. In fact, the term condiments may be said to include spices, seeds, herbs, and any other substance or mixture of substances that imparts an agreeable flavor and taste to food and so stimulates the appetite, thus having some physiological value in speeding digestion. Thus, vegetable seasoning, seasoning salts, salt and vinegar fall within this classification. While none of these substances, with the exception of salt are essential nutritional elements, they make important contributions to general human needs.

5. GENERAL INFORMATION

a. Classification of Spices

From the standpoint of the botanist, spices are classified according to that part of the plant which is most commonly employed for flavoring. This listing presents the more generally known spices.

(1) Barks: Cinnamon

(2) Bulbs: Garlic, onions

(3) Flower buds: Cassia buds, cloves

(4) Fruits: Allspice, mace, nutmeg, pepper (black and white), and vanilla

(5) Leaves: Bay, basil, dill, marjoram, peppermint, sage, savory, spearmint, tarragon, thyme

(6) Rhizomes (underground stems sometimes erroneously called roots): Ginger, turmeric

(7) Roots: Horseradish

(8) Seeds: Anise, caraway, cardamon, celery, coriander, cumin, fennel, fenugreek, mustard, poppy

b. Also additional substances such as food additives that, when used for the purposes intended, in accordance with good manufacturing practice, are regarded by the Commissioner, (Federal Food and Drug) as generally recognized as safe for such use.

c. The following listing relates the spices to their respective families:

	Class	Family	Name
(1)	Cruciferae	Mustard	Mustard (white and black)
(2)	Labiatae	Mint	Marjoram, mint, rosemary, sage, savory, sweet basil, thyme
(3)	Lauraceae	Laurel	Cinnamon, cassia, bay leaves
(4)	Leguminosae	Pea	Fenugreek
(5)	Liliaceae	Lily	Garlic, onion
(6)	Myristicaceae	Nutmeg	Nutmeg and mace
(7)	Myrtaceae	Myrtle	Allspice, clove
(8)	Papaveraceae	Poppy	Poppy
(9)	Padaliaceae	Sesamum	Sesame
(10)	Piperaceae	Pepper	Pepper (black and white)
(11)	Solanaceae	Potato	Pepper (red), cayenne, chilies, paprika
(12)	Ubelliferae	Parsley or carrot	Anise, celery, caraway, coriander, cumin, dill, fennel, parsley
(13)	Zingiberaceae	Ginger	Cardamon, ginger, turmeric

d. Grinding:

(1) Spices are generally sold and used as whole, crushed, or ground. In order to obtain the full true spice flavor, the whole spice is utilized since the flavoring material including the essential oil and resinous matter is confined largely within the cell wall of the spice. When the maximum of flavor is desired the whole spice is ground carefully and controlled so as not to destroy or change the flavor of the spice to any great extent. Every spice grinder mills the particular spice to a degree of fineness most suitable for his trade. Whole spice keeps better and longer than ground spice, since, once the cellular structure is ruptured, the flavoring (oil) constituent is gradually released with a consequent loss in flavor.

(2) The modern spice grinder utilized the latest grinding equipment

such as hammer mills, pulverizers, roll mills, decorticators, cleaning, air separating, and other devices, in order to prevent loss of powdered material and volatile oils and to insure a clean product of proper particle size. Ground spice has a somewhat stronger flavor than the whole spice due to the rupture or breaking of the cell structure with consequent liberation of volatile oil. The color becomes lighter, depending on the degree of fineness; the finer the grind, the lighter the color. This applies to all ground spices.

e. Chemical characteristics of spices:

Spices like other plants having odor or flavor imparting qualities contain volatile oils which the chemist calls "essential oils," because they are the basis of their flavor, and in order to distinguish them from the non-volatile or fixed oils, such as olive, castor, corn, etc. Essential oils are liquids practically insoluble in water, as are the fixed oils; most essential oils are soluble in alcohol, fixed oils (with the exception of castor oil) are practically not; fixed oils are not volatile, whereas essential oils are volatile and can be recovered by distillation. Most of the essential oils are optically active as determined by optical rotation and refractive index. This determination is used as one of the methods for ascertaining purity. Oleoresins occur in spices and other plants as a natural mixture of resinous matter and essential oils. Due to their fatty, gummy and pungent nature, they hold, accentuate, and otherwise contribute to the flavor. Essential oils are complex, chemical substance in that they contain organic compounds, known to the chemist as terpenes, alcohols and their esters, aldehydes and ketones, aliphatic compounds (geraniol, citral), benzene derivatives such as benzaldehyde, cymene and its derivatives thymol and the higher boiling sesquiterpenes. Some spices may contain sulphur compounds, others nitrogen compounds. All of the constituents of the oils are essential to their flavor. In order to have a better understanding of the more common spices, the description, properties, uses, etc., are described in alphabetical order in paragraph 8. The quality characteristics of the various spices are based on current conditions, and allowances must be made for changes in the geographical source of supply and crops from time to time.

6. INSPECTION

a. To judge quality, examine the spice first for rich fresh color (particularly important in the herbs and paprika), then bring it slowly up to the nostrils. Its pungency should rise to meet you. It should be strong and fresh excepting of course the few non-aromatic or faintly perfumed items such as mustard seed, sesame seed, poppy seed, etc. Further detail is contained in Federal Specification EE-S-631, "Spices, Ground and Whole" which outlines grade or standard requirements for each kind and type of spice, sampling inspection, test procedures and other requirements such as preparation for delivery. The inspector must be alert for imitation spices (black pepper, mace, nutmeg) made by spraying a little oil of the spice on a large amount of carrier (usually ground soya, buckwheat, cottonseed hulls or other waste grains).

b. Spices, spice seeds, and herbs are subject to contamination by various animal and insect pests. Domestic and imported spices have been found to contain excreta not only of rats, mice, birds, chicken, and other animals, such as bats, goats, and camels, but also insects, larvae, weevils, months, as well.

c. Because of the untiring effort and vigilance of Government officials, spices are subject to rigid inspection and laboratory examination for approval as a product meeting Government requirements for entry into this country. However, as a further protection, it is the practice of the progressive and reputable members of the industry to safeguard their interests by rejecting any spice found on visual or laboratory examination to be contaminated with insects, their larvae, excreta, and other foreign matter, since on grinding an increase in insect and foreign fragments would result and the grinder would be subject to disciplinary action by public health authorities. In addition to the examination conducted by plant personnel, spice is examined for general appearance including freshness, strength (aroma and taste), color, size and the presence of "drills" (berries or seeds attacked by boring insects), foreign seeds, and matter. Sticks, stones, twigs, stems, etc., are removed during processing by air separators and screening devices.

d. Spices which reach the consumer are seldom adulterated because of the rigid inspection by state and municipal authorities as well as by Federal inspection at the port of entry. However, numerous products have been found to be adulterated while held for sale after shipment in interstate commerce. The adulteration consists, in whole or in part, of filthy substance, i.e., rodent urine, excreta, insects, mold, insect webbing, larvae, etc., indicative of insanitary conditions. Ground spices, however, unlike whole spices may be adulterated by the addition of ground shells of various fruits, foreign seeds, fruit pits, stems, stalks, exhausted dried fruits, inferior quality of variety of spice substitution, wild spice, and others.

e. If presence of adulterants, contamination or imitation spices is detected or suspected, inspectors will forward samples to Laboratory Division, DTO, HQ, DSSC for appropriate tests.

f. Organoleptic classification. Many authorities have attempted to classify spices according to flavor sensation produced. There is no complete agreement as flavor impressions are strictly personal and difficult to communicate by spoken or written words. The number of adjectives used to describe types, intensities, tones and notes and intermediate shades of flavor makes a long and somewhat bewildering list. The description of a spice flavor is based upon personal association and experience. Coriander aroma may impress one as "mouselike"; another as "dry musty spice", a third as "sour earth", and a fourth, "lavender-like". Factors such as the condition of the investigator, the surrounding atmosphere and the strength level at which the spice is studied influence the impression presented by the bouquet. In varying degrees, all flavoring substances are aromatic. Reliance must be placed upon the olfactory sense to determine the palatability of seasoned foodstuffs. In paragraph 8, the inspector will find descriptions of odors and flavors. It must be re-emphasized that each individual's word picture of an aroma or taste is as valid as his neighbors.

7. STORAGE

Spices should be kept in a cool, dry place. If kept in a warm, damp place, spices will gradually deteriorate and lose their strength in that the essential oil (flavoring) ingredient dissipates by evaporation, leaving behind a weak or odorless product incapable of imparting to any appreciable extent any of the original flavor to food. Mold formation with attendant musty odor and taste may also develop under these conditions. Spices like all other foodstuffs should be protected against insect infestation. Some ground spices are subject to caking and attack by insects, and by reason of their oily nature, deteriorate and loss of flavor results. As a general rule, whole or unground spices keep for a longer period of time under normal conditions. Spices are generally fumigated before or after cleaning and grinding by means of gases having germicidal and insecticidal properties. Containers snould be tightly closed after each use so that the valuable volatile oils are not lost. In very hot climates, it is advisable to place spices in refrigerators to guard against infestation and to avoid loss of natural oils.

8. DETAILED DESCRIPTIONS

ALLSPICE (Pimenta Officinalis, lindl.). Also known as pimentoin the trade (not to be confused with pimento, a species of red pepper). Allspice is the dried, nearly ripe fruit of an evergreen tree of the myrtle family and is native to the Western Hemisphere. Most allspice is grown on the island of Jamaica. It is also grown in Mexico, Guatemala and Honduras. Allspice berries are nearly round having a hard shriveled appearance and range in size up to ¼ inch in diameter. Each berry contains two deep brown, reniform (kidney shaped) seeds separated by a very thin membrane. The flavor of allspice resembles a blend of cinnamon, nutmeg, and cloves, hence the name allspice. The odor may be described as fragrant and clove-like; the taste is astringent, slightly bitter and pungent. The flavor is contained in the pericarp (woody skin); the seeds themselves are not nearly as aromatic or pungent, having a slight nutty flavor. Allspice is available both whole or ground and is used in cooking and baking.

ANISE SEED (Pimpinella Anisum L.). The fruit of a small annual plant of the parsley family. Most of the top quality anise seed comes from Spain and Turkey. The seed is small, oval, or vase-like in shape, with a short hair-like stem affixed and light yellow longitudinal ridges or striation. It is similar to caraway in appearance but fuller, and of a gray-brown color. It has a characteristic, agreeable odor, and a pleasant licorice taste. Anise seed is available both whole and ground. It is used in making licorice confections, in baking, preparation of cordials or other liqueurs, and in medicinal preparations, also as a tea to soothe the nervous system and induce sleep.

BASIL (Ocimum Basilicum L.). Also known as sweet basil. The leaf and tender stems of an annual plant of the mint family. Basil is native to India and Persia, now cultivated in Europe (on the North Mediterranean shore) and, a great deal now grown commercially in this country. The flavor is sweet and warm with a pungent undertone and is available whole and ground. It is an important seasoning agent in tomato paste, soups, meat dishes, etc., and also used in the preparation or manufacture of chartreuse and other liqueurs.

BAY LEAVES (Laurus Nobilis L.). The aromatic, smooth, shiny, green leaf of the small evergreen, sweet bay or laurel tree. Bay (laurel) leaves are native to the Mediterranean area. We import bay leaves from Greece, Turkey, Mexico and France. The leaf ranges in size up to three inches in length. The flavor of bay leaves is distinctly pungent. The leaves are available whole or ground. They impart an excellent flavor to meats, soups, sauces, and fish dishes and are used to a large extent in the manufacture of vinegars and pickling compounds.

CARAWAY SEED (Carum Carvi L.). The fruit of a biennial plant of the parsley family. Caraway seed is native to Europe. Almost all caraway seed is imported from the Netherlands. The seeds are light brown with pale colored, somewhat yellowish ridges, hard, about 3/16 of an inch long, curved and tapered at the ends. The flavor is pleasant, warm, slightly sharp, with a sweet undertone. The seeds are mostly used whole. Caraway seed is used widely in bakery products and also in cheeses, sauerkraut, soups, meats, and in mixed pickling spice. It is also used as a principal ingredient of Kummel cordial.

CARDAMON SEED (Elettaria Cardamomum Maton). The dried fruit of a plant of the ginger family, grown in Ceylon, India and Guatemala. The dried cardamon fruit consists of a light, dry, whitish, (Cream to Buff) coconut shaped tough capsule (pod) containing numerous small reddish-brown seeds. The unbleached or green cardamons are grayish or greenish-brown in color. The seeds are irregularly round or angular in shape, about 3/32 of an inch long and 1/16 of an inch thick. They are covered with a thin membrane (or aril). They have a pleasant, aromatic, menthol-like odor, and a cool, slightly pungent taste. Cardamons are available whole bleached, whole green, decorticated (pod i.e., capsule removed and seeds kept whole) and ground. Cardamon is used in bakery and meat products, and as an ingredient of curry and other seasoning.

CASSIA BUDS (Cinnamomum Cassia). These are the dried immature fruits of the cassia plant and impart a flavor like that of cassia or cinnamon bark. They are grayish-brown in color. The shining red-brown seed used in pickling is immersed and snugly held within the calyx. It resembles small cloves in appearance. Cassia buds are useful as a convenient form of adding cassia flavor to sweet pickles and other dishes where small amount of the whole spice is needed.

CAYENNE PEPPER (Capsicum Frutescenes L. and Capsicum Baccatum L., considered a variety of C. Frutescenes) - small-fruited species of capsicum. The whole, dried pods are known as Chili Peppers, Mexican Chilies, Mombasa Chilies, Tabasco Peppers, etc. Cayenne is native to tropical America and cultivated in many other parts of the world. Most of the imported unground Cayenne pepper comes from West Africa. A good deal is grown domestically. It is in the shape of dry shiny pods, flattish, and somewhat wrinkled. The pods vary in size from 3/8 to 2½ inches and in width from 3/16 to ½ inch depending on where grown and according to variety. When ground, the small red, dried fruits or peppers constitute the cayenne pepper of commerce. Cayenne pods and the ground product are hot, pungent, sharp and biting to the taste. Chilies are used in the manufacture of cayenne pepper and used whole for pickling purposes. It is an indispensable flavoring for meat, fish, and vegetable dishes and an ingredient of tabasco sauce, curry powder, pork sausage seasoning, etc.

CELERY SALT. This product is a combination of the fruit of an imported celery plant and fine salt. Used for seasoning for soups, tomato juice, oyster stew, salads, dressing meat and other dishes.

CELERY SEED (Apium Graveolens L.). The seed of a member of the parsley family (not identical with the celery vegetable). Celery seed is native to Southern Europe. Most of our import seeds come from France and India. The French seeds are considered superior as they have the more delicate aroma and flavor and are not bitter. Those from India have a strong flavor, are bitter and astringent to the taste. The seeds vary from tan to a greenish gray in color, with pale colored ridges. They are small in size, rarely exceeding 1/16 inch in length and some are with stalk ends attached. They have the well known characteristic celery aroma and warm slightly bitter taste.

CHILI POWDER. This product consists of a blend of spices, usually ground chili pepper, cumin seed, oregano and sometimes garlic powder and salt, and is used in the preparation of chili con carne, meat, fish and dairy dishes.

CINNAMON (Cinnamomum Cassis) (Cinnamomum Zeylanicum). The dried bark of evergreen trees of the cinnamomum family, a division of the laurel group. Cinnamomum cassia, known in the spice trade as "Cassia" is the bark most commonly sold in this country as cinnamon. In its different sub-varieties, Cassia is native to China, Viet Nam and Indonesia. We import from Indonesia and South Viet Nam (Cinnamomum Burmanni Blume) (Cinnamomum Loureirii Ness). It has a reddish-brown bark, agreeable aromatic odor and a pungently sweet taste. Cinnamomum Zeylanicum is native to and grows mostly on the Island of Ceylon. This type is popular in other parts of the world particularly Mexico but is rarely used in the United States. It is almost buff colored and quite mild. It is available ground and in sticks, and is our most important baking spice. Stick cinnamon is used in pickling and as a flavoring for several kinds of beverages.

CLOVES (Caryophyllus Aromaticus L.). The dried, unopened bud of an evergreen tree. The word "clove" is derived from the French word, "clou", meaning nail. The clove trees were originally found growing on the Molucca Islands, now a part of Indonesia, formerly known as the Spice Islands. The cloves from this area are the world's best in appearance and flavor. Most of the cloves are imported from Madagascar, and Zanzibar. Cloves are usually ½ to 3/4 inch in length. They resemble in shape a round-headed nail. The best cloves are large and plump, just a little wrinkled and of a light reddish-brown color. They readily exude oil when pressed with the finger nail. The flavor of cloves is strong, pungent, with an aromatic biting taste. Cloves are available both whole and ground. Whole cloves are used for many purposes, i.e., studding ham and pork, in pickling fruits and vegetables, and in stews, gravies, etc. Ground cloves are used in baked foods, desserts, puddings, stews, etc., as well as in some dental preparations.

CORIANDER SEED (Coriandrum Sativum L.). The dried, ripe fruit of an herb of the parsley family. The herb is native to Europe. Most of the seeds are imported from Argentina, Morocco, Romania, and Yugoslavia. Coriander is a small seed, ranging in color from white to yellowish-brown, almost round in shape, with alternating straight and wavy ridges. The seeds vary in size from 1/8 to 3/16 inch in diameter. They have a mild distinctive fragrant odor and a pleasant, aromatic taste, reminiscent of a combination of lemon peel and sage. Coriander seed is available whole or ground. The seeds are used for the flavoring of bakery and confectionary products, is an ingredient of pickling spices, curry powder, meat seasoning preparations, and liquors, mainly gin.

CUMIN SEED (Cuminim Cyminum L.). The small, dried, ripe fruit of an annual plant of the parsley family. Cumin seed is native to Egypt and the Mediterranean nations. The seeds are imported principally from Iran, India and Turkey. The seeds are thin, elongated, oval in shape, resembling caraway, and varying from 1/8 to ½ inch in length. They are yellowish-green in color with a strong distinctive aromatic odor and taste resembling caraway. Cumin seed is available whole or ground and is used in the preparation of meat, pickle, and season mixture such as curry powder, chili powder and the like.

CURRY POWDER. A blend of a number of spices, the formulas of which vary with the intended use and manufacturer. There is nothing fixed or rigid about the formulation of this item, since it depends on the flavor to be imparted to the particular dish, such as rice, meat, fish, etc. Any combination of the following spices may be used: allspice, cayenne, cassia, cardamon, coriander, cloves, cumin, fennel, fenugreek, ginger, mace, mustard (yellow), pepper (white and black), and turmeric, in varying amounts.

DILL SEED (anethum Graveolens L.). The dried, ripe fruit of a small annual plant belonging to the parsley family, native to Europe. It is cultivated in many parts of the world, including India, Germany, England, and the United States. The plant resembles the fennel plant but is smaller. The seed is imported mostly from India, with some grown domestically and is tan in color, small, ovular in shape and vary in size 3/16 inch in length to 1/8 of an inch in width. The seed has an aromatic odor, a warm, aromatic and sharp taste, resembling caraway. It is available both whole and ground, and is employed for flavoring soups, meat and fish dishes, pickles. The ground product is used as a constituent of many seasoning preparations.

FENNEL SEED (Foeniculum Vulgare Miller). The dried fruit of a perennial herb of the parsley family, native to Europe and cultivated in many countries, including Germany, Romania, Italy, France, Argentina, Africa, India and Lebanon. Most seeds are imported from India and Argentina. The seeds are yellowish-brown in color, varying in size to 5/16 of an inch in length, are oblong, oval, straight or slightly curved in shape. The seed has an agreeable odor and aromatic sweet taste somewhat like anise, is available whole or ground and is used in bakery products, pickles, and seasoning of soups, fish dishes and sauces.

[illegible] Foenum-Graecum L.). Sometimes spelled Foenugreek. The seed of an annual plant of the pea family, native to Southern Europe. It is grown in France, India, Egypt, Morocco, and domestically. Imports from India, France, Lebanon, and Argentina. The seed is small of an irregular, ovular shape, ranging in length to 3 16 of an inch, and from 5/64 to 1/8 inch in breadth, and the seed is marked by a deep furrow running obliquely from one side. They are very hard and feel like very small pebbles being yellow-brown in color. It has a pleasantly bitter taste resembling that of burnt sugar and is available whole or ground. It is an important ingredient in the manufacture of chutneys, imitation maple extract and some spice blends.

GARLIC POWDER (Allium Sativium L.). The ground, dehydrated product of selected cloves or garlic (a bulbous plant of the lily family). The bulb or the garlic plant consists of a number of small white or purplish, lune shaped bulbs termed "cloves" which are enclosed in a whitish membranous covering. The garlic powder is usually prepared from sound, selected peeled garlic cloves, freed from husk, root and stem, then cleaned, dehydrated, and milled. The powder is cream or creamy white in color and has a strong, pungent, persistent aroma and taste, has numerous culinary uses, and is used commercially by the meat packing industry.

GARLIC SALT A blended dry mixture of garlic powder and free running table salt, with or without starch or other acceptable drying agent (like calcium stearate) to prevent caking. It has the same general use as garlic powder.

GINGER (Zingiber Officinale Roscoe). The root or rhizome of a tuberous perennial plant which flourishes in tropical and semi-tropical countries. It is imported from Jamaica, British West Indies, Sierra Leone, Nigeria and India. Ginger is distinctively aromatic, with a spicy sweet, pungent flavor and is available whole, cracked (broken in bits), or ground. It is used in soda preparations and similar beverages. Ground ginger is used in bakery products, meat preparations, confections, pickling and spice preparations as well as in numerous other products.

HORSERADISH (Armoraeia Lopathi Folia). The root of a perennial sending up numerous, large, scalloped, lance-shaped leaves, and is native ot marshy districts of Eastern Europe. It grows wild along streams of the United States. Externally, the nearly cylindrical shaped root is a pale yellow-white, whitish inside. Its flavor is sharp, biting pungent with a slight lachrymotory effect, and is used in condiment sauces, pickles, dressings and gravies.

MACE (Myristica Fragrans Houtt). The crimson (vivid red) aril or skin which covers the nutmeg kernel. Both the mace and nutmeg are part of the same fruit of a tall evergreen tree whose leaves closely resemble those of rhododendrom. In mace and nutmeg we have the only case of two different spices occurring naturally in the same fruit. The mace forms a lacy pattern around the shell within which the nutmeg or seed grows. The aril is carefully removed, flattened and dried when it changes in color to a pale yellowish to reddish brown and becomes horny and brittle. On grinding, mace becomes yellow-orange in color. Mace and nutmeg are native to the Molucca Islands (Spice Islands). Most mace is imported from Indonesia and the West Indies and has a fragrant, nutmeg-like odor and an aromatic, slightly warm taste, though not as pungent as nutmeg. It is used in bakery products, fish, meat, etc.

MARJORAM (Marjorana Hortensis Moench). The dried leaf of a perennial herb of the mint family, native to Western Asia and the Mediterranean. Imports mostly from France, Chile, and Peru, a good quality is now grown in California. It is gray-green in color. The whole leaves are small, elliptical. When examined under low magnification numerous, downy, whitish hairs will be observed on both sides of the leaf. The flavor is pleasant and distinctly aromatic with a somewhat bitter undertone. Marjoram is available whole and ground and is used in soups, stews, vegetable dishes, meats such as lamb and mutton, in certain of the processed foods, and as an ingredient of poultry dressing.

MINT (Mentha Spicato L.). The dried leaf of a perennial herb. There are numerous species of mint of which spearmint (Mentha Spicata L.) and peppermint (Mentha Piperita L.) are important to the spice trade. It is native to Europe and Asia and is grown domestically. Mint appears as the dried, crumpled, shriveled, whole and broken leaves with leaf-stalks attached to whole leaves or parts of whole leaves and are of a dark green color, and has a strong, sweetish, characteristic odor and a warm, pleasant, aromatic, pungent taste with a cooling after-taste. Mint is available whole, rubbed (crushed) and pulverized, and is the principal flavoring in mint jelly, mint confections and in flavoring meat and fish sauces.

MIXED PICKLING SPICE. This blend usually contains from ten to sixteen different whole spices whose proportions are balanced to create a distinctive flavor. It is primarily used in pickling and preserving vegetables and other food products.

MUSTARD (Sinapis Alba L. and Brassica Juncea L. Brassica Nigra L.). The small seed of an annual plant of the mustard (cruciferae) family. The important varieties are used black (Brassica Nigra) or brown (Brassica Juncea) and white or yellow (Sinapis Alba) and are native to Europe and Southwestern Asia. We grown large quantities of mustard in this country and import the rest of our supply from Canada, Denmark, Ethiopia and the United Kingdom. The flavor is sharp, hot and pungent. Black or brown mustard seed is small, roughly round, varying size up to 1/16 inch in diameter and its color is dark brown. White or yellow mustard seed is small, roughly round, varying in size up to 3/32 inch in diameter. Mustard is available in seed, ground and prepared forms. Seeds are used whole for pickling, spices, as a garnish on salads, and as a flavoring for boiled beets, cabbage and kraut, meats, etc. Powdered, dry mustard (also known as "ground mustard" or "Mustard flour") is obtained by crushing grinding, and sifting the whole mustard seeds. The seeds are crushed to facilitate the removal of the hulls and a portion of the fixed oil which has little, if any flavor. The remainder of the mustard cake is dried, ground and sifted to a fine powder which constitutes the mustard flour of commerce. Pure, ground mustard is a pale yellow color. Ground mustard is blended and graded to distinguish the various qualities. It is used in the preparation of meat dishes, fish, sauces, mustard pickle, tomato dishes, and in the preparation of mustard plasters for the relief of respiratory illnesses. Prepared mustard is a mixture of ground (flour) mustard with salt, vinegar, spices, and other condiments.

NUTMEG (Myristica Fragrans Houtt). The seed of a peach-like fruit of a tropical evergreen tree (for cultivation and nativity, see Mace). Nutmegs were formerly limed to destroy their fertility and some are still imported that way. The fruit is nearly round, of a yellowish-green color resembling a large apricot in appearance. When quite ripe, the husk splits open, disclosing a glossy, deep or grayish-brown nut or kernel about 1/64 inch thick, covered by a crimson skin or aril (the mace). Inside the nut is the seed or nutmeg as it is known in the trade. Nutmegs vary in size up to 1½ inches in length, and 13/16 of an inch in width, oval and some globular in shape, and grayish-brown in color. They are wrinkled in appearance, quite hard, but not difficult to cut. When cut transversely, the surface presents a pale brown color and reveals many brown veins of various lengths extending from the outside or rim of the nutmeg, toward the center. The flavor of nutmeg is sweet with a warm and spicy undertone. Nutmeg is available both whole and ground. It is used in flavoring baked goods, puddings, sauces, vegetables, beverages, spice-blends, processed meats and is recognized as essential in doughnuts.

ONION POWDER. (Allium Capa L.). The ground product of dehydrated onions (a bulbous plant of the lily family). It is creamy-white in color with properties, and an aroma and taste similar to those of fresh onions. It is used in the manufacture of processed meats and sausages and as a convenient substitute for the fresh onion.

ONION SALT. Onion salt is a commercial mixture of free-running table salt and onion powder, with or without starch or calcium stearate added to prevent caking of the product.

OREGANO. (Not as yet classified botanically). The dried leaves of a perennial herb of the mint family. It is also known as oreganum, Mexican oregano, and origan; and is native to the Mediterranean area. The leaves are imported into the United States from Italy, Yugoslavia and Albania. The dried herb is of light-green color. The leaf is brittle and ranges in size up to about 5/8 inch in length and has a strong and aromatic flavor, with a strong bitter undertone similar to marjoram. Oregano is available rubbed (crushed) and ground, and is used in chili con carne, chili powder, and many Mexican dishes as well as in meat, fish, salads and egg dishes. It is the spice that made pizza famous.

PAPRIKA. (Capsicum Annum Linn). The ground, dried, stemless pod of varieties of mild capsicum. Paprika is native to Central America and is imported mostly from Spain. Smaller amounts of a somewhat hotter variety come from Hungary, Bulgaria and Yugoslavia. A good quality is now grown commercially in California. Paprika has a mild pleasant odor and an agreeable, slightly sweet taste, and is available only in ground form. It is used as a garnish or flavoring for salad dressing, fish, meat, and vegetable dishes. As an ingredient of preparations used in processing foods, gives color to all kinds of sausages and other meat productions and in the preparation of numerous condiments.

PARSLEY, DRIED. (Petroselinum Sativum Hoffm). Also known as parsley flakes. The dried leaf of parsley, a member of the Umbellifarene family is native to the Mediterranean area, widely cultivated in the United States and other countries. Our consumption need is supplied by domestic production. Leaves are of a green color, dried, shriveled, curled, and broken leaves. It has a pleasant, distinctive, agreeable odor and taste, and is available whole, rubbed (flakes), or ground. It is used as an ingredient in poultry seasoning, garnish, meat or fish dishes.

PEPPER (Piper Nigrum L.). The small dried, ripe berry of a perennial climbing vine or shrub. Pepper is native to the East Indies and cultivated in India, Indonesia, and other tropical countries. Most pepper is imported from India and Indonesia, Ceylon and Brazil.

BLACK PEPPER refers to berries picked before fully ripe. They are merely dried, cleaned, and shipped. The entire berry is ground. Ground black pepper is composed of both light and dark particles. It has a characteristic penetrating odor and a hot, biting and very pungent taste.

WHITE PEPPER refers to berries left on the vine until fully ripe,when the outer hull or shell has partly separated from the white center. White pepper has a characteristic, penetrating, aromatic odor and a hot, biting and pungent taste, less biting than black pepper. The color should be an even light gray, with a tan shade in the lighter components. Both black and white pepper are available whole, finely or coarsely ground and cracked, and have innumerable uses in the food, particularly meat industry. White pepper is popular where black specks are undesirable.

POPPY SEED (Papaver Somniferum L.). The seed of an annual plant (the opium poppy) of the poppy family and is native to Asia. The seed is cultivated in the Netherlands, India, China, Turkey, Persia, Hungary, Czechoslovakia, and other countries. Those from Netherlands, Poland, and Turkey are considered by the trade as of superior quality. The seeds are very small, seldom exceeding 3/64 of an inch in length, are hard to the touch, have a kidney shape, and are clean looking. The Dutch seed is actually slate colored but is considered "blue" by the trade. Those from other countries are white. Because of consumer preferencefor the decorative blue seed, the white seed may be artificially colored with a harmless blue dye to simulate the blue seed. The white seed is not to be considered as inferior. Despite the fact that opium is found in almost every part of the opium plant, the seeds do not contain any opium and have no narcotic effect. The seeds have a pleasant, crunchy, nutty flavor and taste and are used as a food for cage birds. Available as whole seed, seldom ground, and used as a topping for rolls, bread, and other bakery products, in salads, etc.

POULTRY SEASONING OR DRESSING. A blend usually ground to a uniform mixture. Sage, thyme, marjoram and savory and other spices in suitable proportions are used to yield a flavoring for stuffing fowl, veal, meat loaf, etc.

PUMPKIN PIE SPICE. A blend of cinnamon, cloves and ginger adjusted to bring out the finest flavor of each spice, provides the right flavor for pumpkin pie, spiced cookies, gingerbread, etc. The spices are ground together to insure a uniform product.

ROSEMARY. (Rosmarinus Officinalis L.). The dried leaves of a small evergreen shrub of the mint (Labiatae) family, also known as Rosa Maria. It is native to the Mediterranean area. Most imports are from France, Spain, Portugal and Yugoslavia. The dried leaves are brownish-green in color, resemble a curved pine needle in shape, and seldom exceed one inch in length. It has a distinctly fresh, sweet flavor and is available whole and ground. Used in sauces, vegetables, and meat dishes.

SAFFRON (Crocus Sativus L.). The dried stigma of a plant of the crocus family. It is the world's most expensive spice, native of the Mediterranean area and is cultivated in Austria, Spain, France, Greece, and the Orient. Mostly imported from Spain. Each plant of this variety yields only three stigmas, which are delicate orange-yellow filaments which must be picked by hand. It takes 225,000 stigmas to make a pound of saffron. The flavor is pleasant though somewhat bitter. It is used both as a flavor and as a coloring.

SAGE (Salvia Officinalis L.). The dried leaf of an herb of the mint family, native to Southern Europe and cultivated in Yugoslavia and Albania. Only perfect, green leaves are selected. When dried, they turn a rich silver gray color. The odor of sage, while strong, is fragrant, aromatic, warm, and somewhat bitter and astringent to the taste. Available whole, rubbed (crushed) and ground. Used in meat products, poultry, and fish dishes. The sage brush which grows profusely in the American West has a turpentine flavor and is not fit for food use.

SAVORY (Satureia Hortensis L.). The dried leaf of an herb of the mint family, also known as Summer Savory. It is native to Southern Europe and cultivated in many countries. The leaf is imported largely from Spain and France. The leaves are very small, seldom exceeding 3/8 of an inch in length. The dried whole leaves are brownish-green in color. The flavor of savory is distinctively warm, aromatic, slightly resinous and is available whole or ground. Used in meat products and as an ingredient of poultry seasoning.

SESAME SEED (Sesamum Indicum L.). The seed of an annual plant of the sesamum family, also known as Benne or Bene seed. It is native to Asia. Imported mostly from India, Turkey, China, Nicaragua, Salvador and Guatemala. A domestic variety is grown in Texas. Small, oval-shaped, shiny seed, seldom more than 1/8 of an inch in length. Hulled seed is pearly-white in color. Unhulled seeds vary in color from grayish-white to black. They have a pleasant, faint nutty odor and an agreeable nutty taste. The seeds are available hulled or unhulled, are seldom ground, usually sold hulled. Used as a topping on bakery products and in Halvah, a so-called Turkish confection.

TARRAGON (Artemisia Dracunculus L.). The dried leaves and flowering tops of a small perennial herb, gray-green in color, cultivated domestically as well as in France, Spain, and other countries. The leaf has a fruity, anise-like flavor, and is used to flavor vinegar, pickles, mustard and salads.

THYME (Thymus Vulgaris L.). The dried leaf of a small perennial plant of the mint family, native to Southern Europe. Some cultivated domestically and in Canada. Imports from France and Spain. The dried leaves vary up to ½ of an inch in length, are of a brown-green color, with a distinctively warm aromatic and pungent flavor. When examined under low magnification, many dotted oil glands will be observed. The leaf is available whole or ground and is used as a seasoning for clam chowder, clam juice, meat and fish sauces.

TURMERIC (Curcuma Longa L.). An aromatic root of a plant of the ginger family, native to Indonesia and China. Imports from India, Haiti, and Jamaica, with lesser amount from Portugese Asia, Canada, and Pakistan. Turmeric has a distinctive aromatic flavor, rather sharp and mustardy. Externally, the root is yellowish-brown; internally, orange-yellow. The colors of the ground product vary from orange-yellow to lemon-yellow. The orange-yellow is preferred because the color stands up better when exposed to sunlight. The root is available whole or ground and is used as an ingredient of curry powder, prepared mustard and pickling. Used to replace saffron as a coloring agent.

VANILLA (Vanilla Planifolia Andrew). The bean of a tall climbing orchid of tropical America. It is a native of Mexico where the finest grade of vanilla bean is still produced. Imported from Mexico, Reunion, Seycheles and Madagascar. Most commonly used in the form of vanilla extract. The bean has a deep chocolate-brown color and oily luster.

VANILLA EXTRACT PURE is derived directly from the bean without added flavoring or coloring and with or without the addition of sugar, dextrose or glycerin.